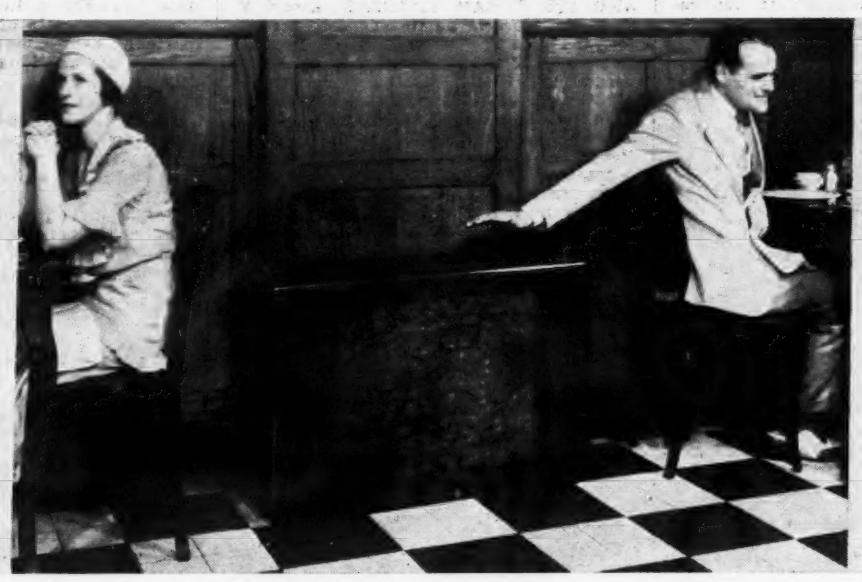
Commercial Condensing Units Find Increasing Number of Applications

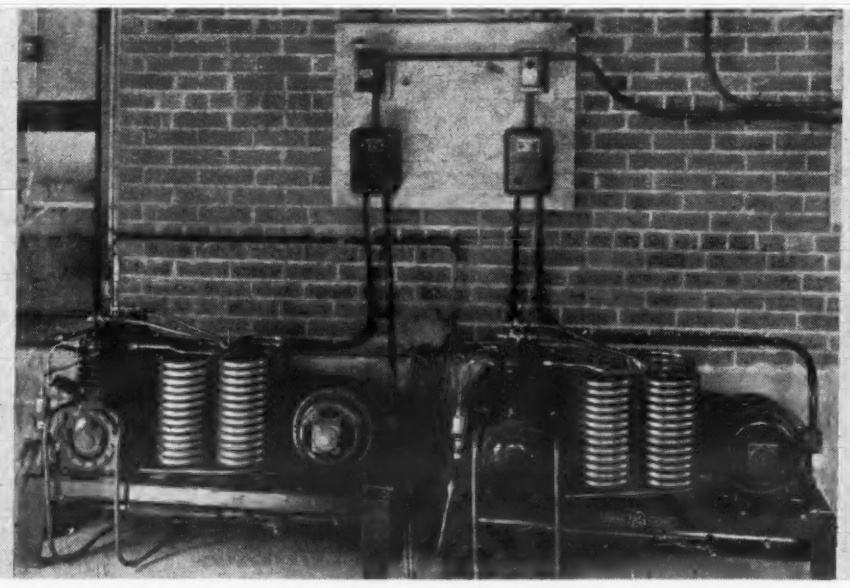
Patrons of Russek's dress shop in Detroit are kept comfortable and dainty by the Frigidaire cabinet-type room cooler shown in the background.



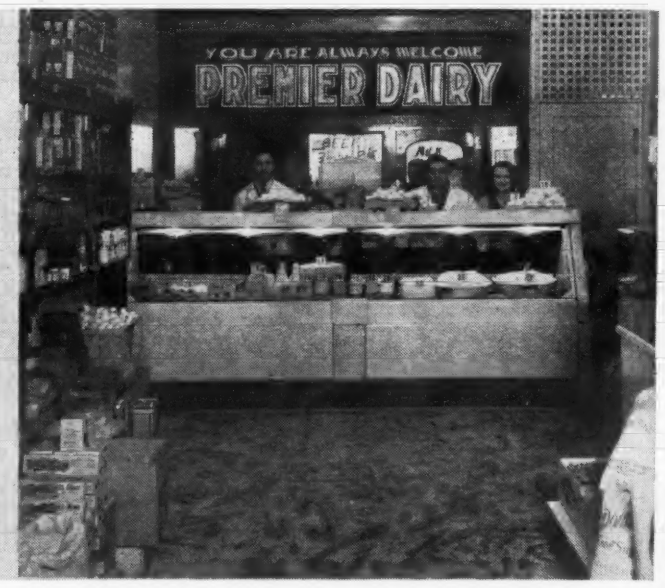
Restaurant patrons find their meals more enjoyable in the conditioned air furnished by the Westinghouse unit pictured here. This unit can also be designed to introduce outside "fresh" air if desired.

In this Minneapolis candy store the wall-type air-cooling unit installed by Harold Schaefer, Inc., Universal Cooler distributor, provides ideal temperatures.

This complete food store uses Seeger display case equipment not only for meats but also for dairy items.



Two General Electric 2-hp. commercial condensing units hooked up in a meat installation for a large capacity job of food preservation.



McCray's first 1934 display case model sets a new "styling" trend and is finished in two-tone porcelain.

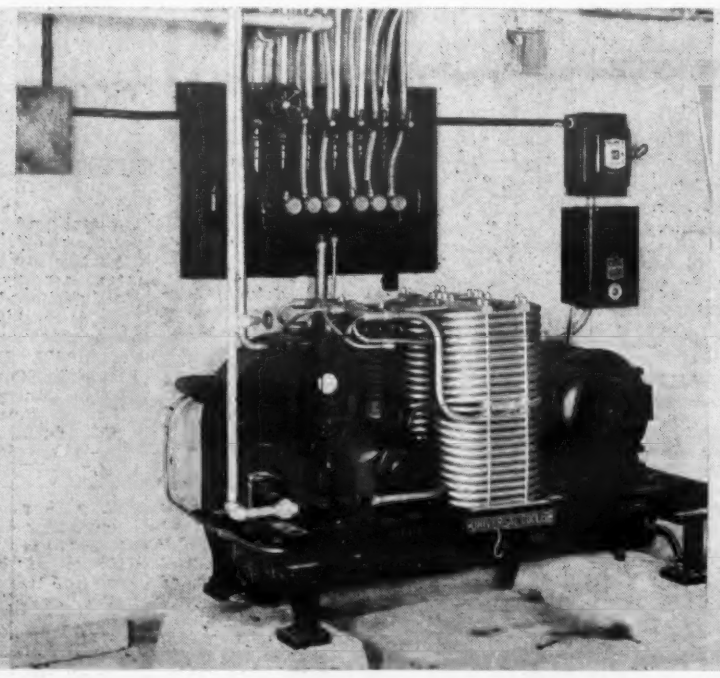
These three misses and a cutaway model demonstrate the "instantaneous cooling" feature of Frigidaire's draft beer dispenser and cooling unit.

Brunswick-Balke's new mechanically refrigerated salad counter has a decorative attendant.

Westinghouse exhibits a streamlined beverage cooler which it will make for dispensers of bottled Coca-Cola this year.

General Electric's cabinet-type air conditioner for offices makes for efficient work and keeps executives in good humor.

G-E's conditioned-air evaporators provide proper temperatures for the Highland Park Dairy, New York City.



This big 10-hp. Universal Cooler methyl chloride condensing unit is installed in a Kroger super-market at Oak Park, Ill.

Forced-convection cooling of perishables through flues in the end of these Ridgway cases features this Philadelphia installation.

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THE NEWSPAPER OF THE INDUSTRY

ELECTRIC REFRIGERATION NEWS

WRITTEN TO BE READ ON ARRIVAL

Registered U. S. Patent Office

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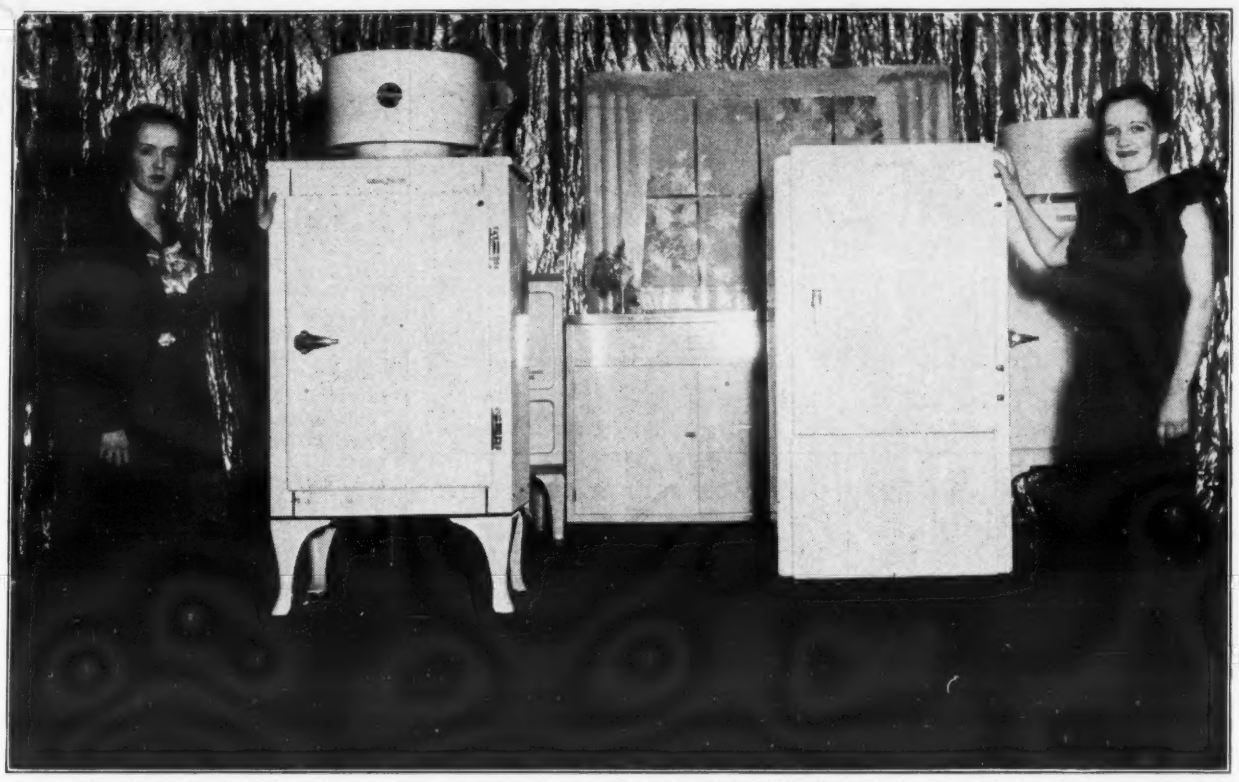
G-E INTRODUCES MODERNIZED FLAT-TOP MODEL

G-E Contributes to the Beauty Trend in Refrigerators



The beautified Monitor Top model and the radically styled new G-E flat-top refrigerator are being introduced to dealers in 'style' shows staged with formally gowned models like the ones pictured here.

Merchandisers Draw Up Trade Regulation Pact

Kansas City Distributors Draft Practice Rules on Commercial Sales

KANSAS CITY, Mo.—Thirteen Kansas City distributors of commercial refrigeration equipment recently met for the purpose of drawing up a series of provisions designed to promote better trade practices and better business in their particular field of endeavor.

The following plans for cooperative activity were drawn up with the assistance of G. W. Weston, secretary-manager of the Electric and Radio Association of Kansas City:

1. *Joyriding*—whenever a unit is "pulled" for credit reasons, the name and address of the firm and the name of the unit are given to Mr. Weston. This information is filed and sent out, as permitted by law, on specific inquiry from any of the firms. On contacting a "pulled" job, the seller telephones Mr. Weston for information.

2. *Salesmen*—should be instructed to observe the ethics of good business and be cautioned against such tactics as kuocking, exaggerating, and chiseling.

3. *Bootleg service men*—caused much dissatisfaction among customers and,

(*Concluded on Page 2, Column 1*)

Westinghouse Spring Drive Opens Mar. 26

MANSFIELD, Ohio—Starting March 26 Westinghouse electric refrigerator salesmen will be "Going to Town" in a 7-weeks sales contest of that name.

During the period of the "Going to Town" contest salesmen will be aided by a concentrated advertising and sales promotion campaign. Magazines, direct mail, newspapers, and billboards will carry the Westinghouse story to the public.

Feature of the sales contest will be the selection of an individual quota by each salesman. Cash awards will be given, and they have been staggered

(*Concluded on Page 2, Column 5*)

Prof. Willard to Head University of Illinois

URBANA, Ill.—Prof. A. C. Willard, well known air-conditioning engineer and head of the department of mechanical engineering at the University of Illinois here, was made president of the university on March 13 by unanimous vote of the board of trustees. He is a past president of the American Society of Heating & Ventilating Engineers, and has been serving as acting dean of the university's College of Engineering.

Sanitary Electric Corp. To Handle Sales of Refrigerators

FOND DU LAC, Wis.—The Sanitary line of household electric refrigerators will henceforth be marketed by the Sanitary Electric Corp., a newly-formed company which purchased the domestic electric refrigerator business of the parent company, the Sanitary Refrigerator Co., in January.

A separate sales organization to handle the household electric line is now being maintained, and the line will be aggressively merchandised on a direct-to-dealer sales plan, according to B. K. Miller, secretary of the Sanitary Electric Corp.

The new company is maintaining a complete sales exhibit in space 14108 Merchandise Mart, Chicago, but main offices of the company are located in Fond du Lac.

Export sales connections have been

(*Concluded on Page 4, Column 3*)

Kelvinator Corp. Declares 12 1-2 Cent Dividend

DETROIT, March 20.—Kelvinator Corp. has declared a dividend of 12½ cents per share, payable to stock of record March 22, it was announced today by the board of directors.

Refrigerator Prices Too High--EH & FA

WASHINGTON, D. C.—Prices on electric refrigerators which were offered to the Electric Home and Farm Authority for sale in the Tennessee Valley Authority regions last week were declared to be too high for families of modest incomes by David E. Lilienthal, director of the EH & FA.

Mr. Lilienthal announced that prices placed on electric ranges and water heaters by manufacturers who have

(*Concluded on Page 2, Column 3*)

Quinn Cites Trend To Hermetic Units

By George F. Taubeneck

CHICAGO—"In 10 years—perhaps in 5—I'll be surprised if dealers are selling anything but hermetically sealed machines. The trend is all in that direction." So spoke T. K. Quinn, vice president of the General Electric Co. at the seventh anniversary banquet and dealer meeting of R. Cooper Jr., here Thursday night, March 15.

"Every year the proportion of sealed machines, as compared with the open type, sold in the United States becomes greater," declared Mr. Quinn, "and I am confident that as the years go by more and more manufacturers

(*Concluded on Page 2, Column 4*)

Kelvinator Announces New 'Price Leader' Model

DETROIT—Kelvinator Corp. has recently introduced a "price leader" model, selling in the Detroit zone at $105 delivered and installed (but not including Federal tax), with 4.22-cu. ft. net food storage capacity and an exterior cabinet finished in lacquer, in addition to the four series of models in its 1934 line announced some time ago.

The new model "V," as it will be designated, has a food storage compartment interior of porcelain, a control panel with eight temperature variations, vacation and defrosting setting, start and stop switch with automatic overload protection, bar type shelves and broom high legs.

Shelf area of the new model is 8.35 sq. ft. Cabinet is insulated with 2 in. of Kelvatex insulation in the ends, and 2-11/16 in. in the back and bottom.

Two ice cube trays make 42 ice cubes or 3.4 lbs. of ice per freezing.

Harten - Knodel Places 33 Carload Norge Order

CINCINNATI—An order for 33 carloads of household refrigerators has been placed with Norge Corp. in Detroit by the Harten-Knodel Distributing Co., Norge distributor here.

Monitor Top on 2 Models Gets Stylish Sheath

Flat-Top Model Has Unit In Bottom, Sells at $160.00 f.o.b.

CLEVELAND—Smartly styled new deluxe models in both the "Monitor Top" and flat-top series have been added to the line of General Electric household refrigerators.

The new Monitor Top models both have 7-cu. ft. net capacity, one having a porcelain exterior and the other being finished in glyptal. The porcelain model is priced at $255 f.o.b. factory and the glyptal model at $230 f.o.b. factory. The flat top has an exterior finish of glyptal and is priced at $160 f.o.b. factory. Condensing unit in the new flat-top model is installed *below* the food compartment, unlike all previous G-E refrigerators.

G-E's new deluxe models were designed by Henry Dreyfuss, famed New York "stylist to industry." Distinctively modern lines mark the new flat top, the door panel being superimposed on the side panels and extended to meet the cabinet top at right angles, with the sides curving gracefully into the front panel just below the top of the cabinet.

The semi-concealed hardware and door handle have also been finished with glyptal inserts, the tips being

(*Concluded on Page 11, Column 1*)

Servel Presents '34 Sales Program

EVANSVILLE, Ind.—Sales supervisors and sales technicians from Servel's branch stores in St. Louis, Chicago, Cleveland, Buffalo, and Pittsburgh convened recently at the Servel factory to hear the company's plans covering its 1934 program of advertising and sales promotion for commercial refrigeration and air-conditioning products.

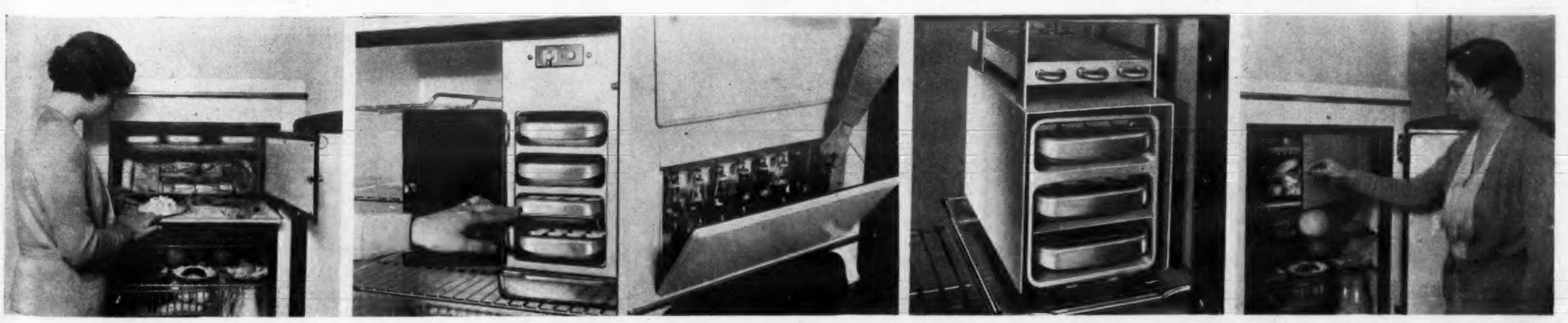
The opening meeting was devoted to outlining Servel's general plans, the remaining conferences to completing plans concerning the operation of the various branches for a direct-to-the-public promotion, through dealers, of the sale of commercial refrig-

(*Concluded on Page 4, Column 4*)

Zerozone Creditors to Meet March 23

CHICAGO — First meeting of the creditors of Zerozone Corp., which was adjudicated bankrupt Feb. 14, will be held at 9:30 a. m. March 23 in room 1201 at 100 W. Monroe St., here, according to announcements made by Edmund D. Adcock, referee in bankruptcy.

New Convenience Features and Controlled Humidity Mark 1934 Potter Models



Potter's sliding shelf simplifies rearrangement of items in the frozen-food storage compartment. (2) The tray release may be transferred from one tray to another. (3) Every Potter model has this bottle storage rack. (4) A shield around the evaporator (in three models) prevents air in the food compartment from passing through the ice-freezing chamber. (5) Two models feature a freezing compartment closed off from the rest of the food chamber by a porcelain door. The model in these pictures is Miss Muriel J. Bell, secretary to T. Irving Potter, president.

SPECIFICATIONS OF 30 HOUSEHOLD REFRIGERATORS IN THIS ISSUE

Kansas City Dealers Draft Sales Pact

(Concluded from Page 1, Column 1)

in many cases, actually hurt the entire field of commercial electric refrigeration. It was agreed to sell equipmen and parts at standard discounts only to authorized service men. All others will pay the full list price.

4. *Staying off a "sold" job*—distributors agreed to stay off and not try to unsell a job that was "sold." It developed that some salesmen had, in the past, caused considerable and expensive difficulties in this respect.

5. *Underpowered jobs*—it was agreed that it was harmful for a selling organization to underpower a job—sometimes done under pressure of competition.

6. *Promotion of mechanical refrigeration for beer cooling* — each firm agreed to send to Mr. Weston a list of their Greater Kansas City successful draft beer cooling installations. The name and address of such installations would be available for the use of all distributors as testimonials for mechanically refrigerated beer coolers. Such testimonials would also be available for newspaper and direct-mail advertising. It was further suggested that salesmen "cultivate" old-time bartenders and gradually rid them of the idea that new methods of beer cooling are not as good as former ways.

7. *Proper sizes for apartment house installations*—were agreed upon and cards covering this data were printed for use by salesmen in contacting prospective buyers. It is felt that the cumulative effect of several salesmen strongly recommending the sizes specified is certain to have a beneficial effect in counteracting the tendency to install too small a unit.

Proper sizes for apartments, as set forth on the card, are as follows:

No. of persons	Size in cu. ft.
2	4
3	4
4	5
5	6

In this method of rating a cabinet with 4.4 cu. ft. capacity rates as a 4 cu. ft. model, a cabinet with 4.6 cu. ft. as a 5 cu. ft. model, a cabinet with 5.4 cu. ft. capacity as a 5 cu. ft. model and a cabinet with 5.6 cu. ft. capacity as a 6 cu. ft. model.

Connelly Co. Moves Offices To Larger Quarters

SEATTLE — Since March 1, two branches of the F. B. Connelly Co., Grunow distributor in this area, have been moved into new and larger quarters. Main offices of the organization are in this city.

In Seattle, the company has moved into its own building at 1015 Republican St., while the Portland, Ore. branch is now headquarters at Northwest Sixteenth Ave. and Lovejoy St. New manager of the latter branch is Don. H. Slocum, formerly of the Kimball-Upson Co. in Sacramento, Cal.

Massachusetts Plans Air Conditioning Course

BOSTON—A home study course in air conditioning is now offered by University Extension, Massachusetts Department of Education, according to James A. Moyer, director, at the State House here.

The course combines instruction in the necessary theoretical background and fundamental practices, and contains extensive illustrative examples of the calculations necessary in the application of equipment to residences, office buildings, restaurants, theatres, food factories, and textile mills.

Sparton Forms Auto Radio Sales Department

JACKSON, Mich.—A new department to promote sales of Sparton automobile radios has just been organized by the Sparks-Withington Co.

Planning for the Modern Kitchen

A modern note in lighting and design has been achieved in the desk of Edwina Nolan, home service director of the General Electric Institute.

Kelvinator Has School On Air Conditioning

DETROIT—Fundamental principles of air conditioning and advance data on the air-conditioning equipment which Kelvinator will bring out shortly were treated in an air-conditioning school which ended last week for field men, distributors, and branches of Kelvinator Corp.

The school was held at the factory here, and was conducted by M. C. Terry, in charge of air-conditioning engineering at Kelvinator.

First part of the school, from March 5 through March 9, was devoted to engineering, and included fundamental principles, use of the Kelvinator humidity chart (published in the July 12, 1933 issue of ELECTRIC REFRIGERATION NEWS), estimating B.t.u. loads, air-conditioning standards, proper selection of equipment, performance guarantees, and cost estimating.

Second part of the school, March 12 and 13, included sales methods, with instruction in non-technical fundamentals, a study of the market, prospects and how to develop prospect lists and sales planning.

Crounse Manages Store For A. Wayne Merriam

ONEONTA, N. Y. — Thurston Crounse has been appointed manager of the General Electric appliance store operated by A. Wayne Merriam, Inc., Schenectady distributor.

Refrigerator Prices Are Too High - - EH & FA

(Concluded from Page 1, Column 3)

submitted such products gave promise of being satisfactory. The prices are from one-fifth to one-third lower than the lowest prices now listed by manufacturers, according to Mr. Lilienthal.

While the price reductions on electric refrigerators were comparable to those on ranges and water heaters, Mr. Lilienthal explains that they are believed to be too small a cut in view of the potential volume of sales—estimated by him to be 150,000 units.

Approval of appliances examined by the EH & FA is dependent upon results of laboratory tests made by the Bureau of Standards and the Bureau of Home Economics.

Mr. Lilienthal says that until August the work of the EH & FA will be confined to the Tennessee Valley. After that a reasonable expansion of its program may be made to other parts of the nation, he declared.

Cole Sponsors Contest for Non-Selling Employes

NEW YORK CITY—Rex Cole, Inc., G-E distributor here, is now sponsoring a contest among employes of the operating, delivery, and service departments, in which they are offered cash prizes for best 150-word suggestions as to how they can best boost the company's volume.

Quinn Predicts Trend To Hermetic Machines

(Concluded from Page 1, Column 3)

will adopt this method of supplying refrigeration to homes.

Mr. Quinn also offered up thanks for President Franklin D. Roosevelt and the measures he has taken to speed up the nation's recovery.

"Don't forget," Mr. Quinn told his auditors, "that a twelvemonth ago all was despair in the United States. Despite the newspaper criticism of the President's policies today, we must remember that under his direction the country has regained the highway to prosperity."

Thus far this year orders for General Electric appliances have reached a total approximately twice as great as orders on hand for a similar period in 1933, Mr. Quinn stated.

P. B. Zimmerman, manager of the specialty appliance division of the General Electric Co., was another headliner at the banquet. His talk was devoted to the presentation of the G-E specialty selling program.

Employes of the R. Cooper Jr. organization were presented with pins indicating the number of years they have served the organization by Dick Cooper himself. The employes then returned the compliment by giving Mr. Cooper a tall-and-handsome-but-most-assuredly-not-dark silver cup.

Jean De Jen from the Cleveland office performed a few of his Feats of Legerdemain and Prestidigitation (parlor magic to you) during the banquet. His act was augmented by entertainers from the last Club Royale floor show.

In the afternoon more than a thousand dealers swarmed into the ballroom of the Palmer House to see the swift revue of dramatic skits, sketches, talking pictures, and spotlit monologues which comprise the 1934 G-E road show for dealers.

The new G-E Monitor Top and flat-top refrigerator models (see story beginning on page 1 of this issue) received the greatest applause. Other products shown on the elevated stage included a coordinated electric kitchen, home laundry, commercial refrigeration equipment, and vacuum cleaners.

Assisting the Cleveland personnel (H. Ferguson and C. May) in putting on the show were the following Cooper men: Vice President C. G. Rood, who talked on apartment house prospects, F. A. Ramsdell of the kitchen planning division, W. F. Cuff of the range division, Vice President Lou Kohlman of the commercial division, Johnny Duncombe, newly appointed sales training manager, A. S. Irvine and Sam Nides, sales promotion manager. Retail Salesmanager H. W. Gifford was ill and couldn't attend.

W. A. Gluesing of Schenectady did some House of Magic stunts, and J. Strecker of Bridgeport talked about G-E laundry equipment to complete the program.

H. H. Bosworth, central station division manager, Walter Landmesser, commercial division manager, A. A. Uhalt, dealer division manager, and Ralph Cameron, department store division manager, came over from Cleveland to attend the meeting.

Westinghouse Spring Drive Opens Mar. 26

(Concluded from Page 1, Column 1)

so that the higher the quota the salesman sets for himself, the greater the amount of the award if he makes quota.

Prize credits will be earned on the basis of the model number of the Westinghouse refrigerator sold. For instance, a BL-43 earns 43 credits, a BL or BP-45 earns 45 credits, etc.

There are six different quota classes as follows: class A, 250 credits; class B, 500 credits; class C, 750 credits; class D, 1,000 credits; class E, 1,250 credits; and class F, 1,500 credits. Value of each credit for the various quota classes are: class A, 3 cents per credit; class B, 4 cents; class C, 5 cents; class D, 6 cents, class E, 7 cents, class F, 8 cents.

The value of all excess credits over the quota selected by the salesman will be exactly the same as the value of each credit that makes up quota. For instance, if the salesman sets a quota of 1,000 credits, and actually earns 1,150 credits, he will receive 1,150 times 7 cents in cash.

If, however, the salesman fails to make the quota he has selected, the value of the credits will be worth 3 cents each, except for salesmen in quota class A who will receive nothing.

Salesmen are being asked to use a 5-step prepared selling plan during the period of the contest. Each step has been carefully prepared by sales executives and the salesmen will be prepared with adequate sales presentation material for the various sales steps, which are (1) getting into the prospects' homes, (2) the pictorial feature demonstration, (3) complete demonstration with sales kit, (4) the improved dramatic demonstration, (5) "closing" or getting the order.

To help salesmen in their "closing" arguments, Westinghouse sales planners have devised a "balance sheet" in the form of a two column notebook-size pad, with a dividing line down the middle. On one side the salesman places the arguments for the Westinghouse refrigerator, he invites the prospect to put down any possible objections on the other side, thus attempting to bring out any hidden sales resistance.

Entrants in the contest will also tie in with the "Owner Satisfaction and Loyalty" campaign now being conducted nationally.

The direct mail campaign is a three-piece series which incorporates a new technique and method of treatment. Piece No. 1 is titled "Through Different Eyes" and tells a story, packed with human interest, of how different types of prospects have looked at the Westinghouse refrigerator. The second piece is a roto news-picture sheet in tabloid size and format, showing interesting views of Westinghouse models from every news angle. The third and final piece presents the Westinghouse line, advantages and features.

Frigidaire Men Attend Air-Conditioning School

DETROIT—Local Frigidaire engineers convened last Thursday, Friday, and Saturday for a conference on air conditioning at the Frigidaire branch here. Frank C. Lyons, director of education for Frigidaire's air-conditioning division at Dayton supervised the meeting. R. F. Callaway, branch manager, was chairman, assisted by E. E. McEwan, in charge of air-conditioning sales in Detroit.

Georgia Power Co. Opens First '34 Sales Drive

ATLANTA—Georgia Power Co. last week opened its first major 1934 sales campaign—an eight weeks sales drive on electric ranges and water heaters. Total quota for the drive is 1,500 units—1,200 electric ranges and 300 water heaters. Advertising broke last week in 149 newspapers.

Frigidaire has always been noted for possessing a number of high-powered orators on its headquarters staff. Herewith are presented some of these spellbinders in characteristic action poses. The pictures were taken at recent conventions by the editor, and were scissored out of their stage backgrounds by Proof reader Helen Gilmore. Top row: (1 and 2) "Army" Ambrose of the commercial department; (3) Advertising Manager Earl Doty; (4) Jim Nance, head of the air-conditioning department; (5) Chairman Rockwell of the Frigidaire factory workmen's committee. Bottom row (1, 2, 3, 4, and 5) Jim Nance; (6, 7, and 8) "Army" Ambrose; (9) President E. G. Biechler.

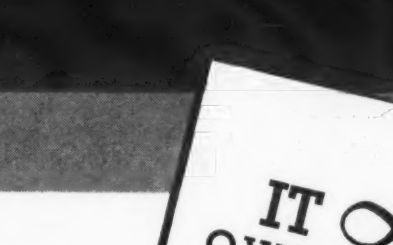
ISN'T THIS THE KIND OF ELECTRIC REFRIGERATOR YOU WANT TO SELL?

IT Leads IN OWNER SATISFACTION

Interviews in 15,000 average homes by the Houser Associates of New York rated the ABSOLUTE SATISFACTION of people owning refrigerators of different makes in the following proportion (four highest ranking makes only are shown):

IT Leads IN OWNER LOYALTY

In rating of OWNER LOYALTY (percentage of owners saying they would buy the same make owned if they were to choose over), Westinghouse again led the next three ranking makes in the following proportions:



GIANT SPRING PROGRAM STARTING!

Action and Profit for Everyone!

A smashing national advertising program featuring statements of enthusiastic Westinghouse owners from coast to coast! A complete tie-in program of newspaper, outdoor and direct-mail advertising. A PLAN-OF-ACTION for dealers that provides real money-making ideas and selling help! That's what Westinghouse is putting, this Spring, behind the refrigerator that today leads all other makes in the satisfaction and loyalty of its owners. What more could you ask as a guarantee that you can make money with Westinghouse in 1934?

Get complete information at once. Right now you can still get in on the fastest-moving proposition in refrigeration. Satisfied owners will help you sell Westinghouse. No matter what you are now handling, the Westinghouse Franchise Comparison Chart will open your eyes to a *new* opportunity!

Send for this Chart today. It takes only a few minutes to study, and those minutes may prove to be worth thousands of dollars apiece to you. We'll also include our jumbo Spring Campaign Announcement, showing the material and plans that are ready to help you the minute you "join up." Simply use the coupon . . . and mail it today.

COMPARE THE FACTS

The Franchise Comparison Chart offers you the opportunity to compare the Westinghouse proposition with any other, on 100 points of vital importance. Send for it now.

EVERY HOUSE NEEDS WESTINGHOUSE

Westinghouse Refrigerators

Westinghouse Electric & Mfg. Co.,
Refrigeration Division (ERN-3-21),
Mansfield, Ohio.

O. K. Send us the Franchise Comparison Chart and your Spring Campaign Announcement.

Name .....

Address .....

City ..... State .....

N.Y. Meeting Attended By 600 Norge Dealers

By George F. Taubeneck

NEW YORK CITY—Dealers who hadn't been anywhere since 1929—except in the red—attended the annual spring meeting of the Norge Corp. of New York held Wednesday, March 7, in the Park Central hotel. Eastern Manager Glen O'Harra brought 600 of them in to see the 1934 Norge line.

John Knapp, vice president in charge of sales of the Norge Corp., led the meeting, assisted by Mr. O'Harra. Also on the bill were Walter Seiler, vice president of the Cramer-Krasselt Co., Norge's advertising agency, William Crawford of the Commercial Credit Co., Dayton Young, sales manager of the washing machine division of Norge Corp., and Betty Appel, home economist.

Representatives of the merchandising departments of practically all the department stores in metropolitan New York were guests at the meeting.

Other special guests included Howard Winegar, president of the Commercial Credit Co., Ben Oppenheim, Norge distributor in Newark, David Burke, Norge distributor in Detroit, and Dave Trilling, Norge distributor in Philadelphia.

Following the New York meeting, Mr. Knapp and his troupe went to Boston, where they held forth Friday and Saturday for Jack Waddell, Boston Norge distributor.

Nema to Meet May 21-24 At Hot Springs

NEW YORK CITY — The annual spring meeting of the National Electrical Manufacturers Association will be held May 21 to 24 at "The Homestead," Hot Springs, Va., the Board of Governors of Nema has announced.

Oklahomans See Servel Commercial Units

OKLAHOMA CITY — Dealers from all parts of Oklahoma gathered at the Skirvin Hotel here recently at a meeting sponsored by the Harbour-Longmire Co., Servel distributor, to see the new air-cooled Electrolux and the Servel line of air-conditioning and commercial refrigeration equipment.

Featured in the showing of the air-conditioning models was a floor-type model for all seasons with remote-installed condensing unit, a self-contained model, a semi-portable model for summer cooling, and a heavy-duty suspension type unit available for either summer cooling alone or for year 'round use.

W. Paul Jones, advertising and sales promotion manager of Servel Sales, Inc., conducted the demonstration of air-conditioning and commercial refrigerating equipment. Other factory representatives were R. F. Wheeler, district sales representative; C. A. Spiegel, Electrolux sales promotion department; E. L. Jolly, Electrolux district sales representative; and Michael Noll, cadet engineer of the Electrolux division.

Leonard Shipments Show Big Gain in February

DETROIT — Leonard Refrigerator Co. here beat all its former February shipping records last month, when 222 per cent more units left the factory than in the corresponding period of 1933, according to H. W. Burritt, vice president in charge of sales.

Shipments during January and February were 142 per cent greater than those of the corresponding months of 1933.

New Refrigerator Shelving

Diamond mesh expanded metal shelving introduced by U. S. Gypsum Co. prevents small objects from sticking or falling through the mesh.

New Company to Handle Sanitary Electrics

(Concluded from Page 1, Column 2)

made and the new corporation has already received quantity export orders from South Africa and Ireland.

Officers of the new corporation are Carlton Mauthe, president; H. B. Miller, vice president; B. K. Miller, secretary; Wm. Mauthe, treasurer.

U. S. Gypsum Develops Diamond Mesh Shelf

CHICAGO—Expanded metal shelving for electric refrigerators has been introduced by the steel products division of the U. S. Gypsum Co., with main offices here. The new material is known as "Shelf-X" and is furnished as a diamond mesh as shown in the illustration above.

The shelving is cold drawn from pickled and annealed 16-gauge open-hearth steel, and has an elastic limit of 70,000 lbs. per in., according to A. C. Griffith, in charge of sales of the material for the Gypsum company. The shelving is claimed to eliminate tipping of dishes, having a smooth surface.

The diamond web is also shaped that a U. S. silver quarter can rest flat any place on the shelving. The diamond-shaped opening in the web is about 2⅛ in. long and ¾ in. wide.

It has no greater area than the ordinary wire shelf, Mr. Griffiths declares, so that air circulates in the refrigerator just as readily as with other shelving materials.

U. S. Gypsum makes the Shelf-X web for fabrication into any type of refrigerator shelf by the shelf manufacturers. It has been approved for 1934 production by Grunow, Starr, Jewett, and the Rich-Illinois Co.

Cole Plans Newspaper Advertising Campaign

NEW YORK CITY — "Newspaper advertising will form the main line of attack in our spring campaign," Rex Cole, G-E distributor here, told 1,000 public utility and department store officials, dealers, and salesmen when they assembled at the Waldorf-Astoria March 5 for the Rex Cole Institute inaugural convention.

"Part of our expansion program comprehends the immediate addition of 200 salesmen to our force, each with a definite territory.

The meeting was held under the management of E. H. Campbell, manager of Cole's sales promotion department, Carle B. Robbins was stage director.

Servel Introduces 1934 Commercial Program

(Concluded from Page 1, Column 5)

eration and air-conditioning equipment.

A technical school constituted part of the three-day session, at which branch representatives were given complete instruction and explanation of the features and functions of Servel air-conditioning equipment and its application to various household, business, and industrial uses.

P. B. Wiske, general manager of branch operations, directed the conference. In addition to Mr. Wiske, members of the factory sales organization who addressed the meetings included C. A. Miller, sales manager; W. Paul Jones, advertising and sales promotion manager; W. J. Aulsebrook, sales application engineer; and C. L. Olin, service manager.

Hommel Moves Offices To Larger Quarters

PITTSBURGH—Ludwig Hommel & Co., Norge distributor here, has moved its offices and salesrooms to new and larger quarters in the Try St. Terminal at 600-620 Second Ave., according to Ludwig Hommel, president. The company was formerly located at 929 Penn Ave.

EARNINGS

General Electric Co.

SCHENECTADY, N. Y. — Preliminary report presented March 2 to the directors of the General Electric Co. shows that sales billed by all divisions of the company during the fourth quarter of 1933 amounted to $39,211,122, compared with $34,112,816 for the same quarter of 1932, and were the largest for any quarter since the second quarter of 1932.

Total sales billed for the year 1933 were $136,637,268, compared with $147,162,291 for 1932.

Earnings for 1933 available for dividends amounted to $13,429,739, compared with $14,404,110 in 1932. Cash and marketable securities, exclusive of restricted funds in closed banks, amounted to $111,878,508, compared with $116,108,017 a year ago.

Total current assets amounted to $175,314,394 and current liabilities amounted to $13,302,577, at ratio of 13.2 to 1.

The total of common stock and earned surplus, not including appreciation in foreign exchange, at the end of the year was $297,908,662, compared with $302,511,766 a year ago.

Orders received during 1933 exceeded shipments for the first time since 1929, leaving a greater amount of unfilled orders at January 1, 1934, than the year before. Orders for January and February 1934 exceeded those for the same months last year by approximately 49 per cent.

The board decided to recommend to the stockholders at the annual meeting on April 17, approval of a profit sharing plan which embraces all employes and on which the executives of the company have been working for some years.

Two years ago the dividend on the common stock was reduced from 40 cents per share per quarter to 25 cents, and in May, 1932 to 10 cents, a total reduction of 75 per cent.

The board has voted, however, to increase the dividend to 15 cents per share on the special stock and to 15 cents per share on the common, to holders of record on March 16, payable April 25.

Stewart-Warner Corp.

CHICAGO—Annual report of Stewart-Warner Corp., released March 7, reveals a large increase in business during the last six months of 1933 and the first two months of 1934, and a general reorganization of capital structure, accounting, manufacturing, and distribution practices.

(This report is for the entire Stewart-Warner Corp. and *not* for the refrigeration division alone.)

In former years all expenditures for experimental and development work and depreciation on non-operating plant facilities were charged directly against surplus, whereas in 1933 they were charged against earnings. For 1933, the loss was $1,791,060, most of which was sustained in the first six months.

Current assets of the company are shown as $5,154,579, and current liabilities, $1,403,653.

As of Dec. 31, 1933, $2,262,759 was charged against surplus, representing principally the reduction of idle machinery, equipment and plant not used in operation to estimate realizable value.

Consolidated balance sheet as of Dec. 31, 1933 shows a working ratio of 3.67 to 1, with cash and government securities nearly equalling current liabilities.

The report states that sales of all the company's products in January, 1934, totaled $1,120,584, an increase of 128 per cent over a year ago. February sales of $1,284,776 increased 150 per cent over a year ago.

Sales volume of $6,357,598 for the last six months in 1933 showed a gain of 70 per cent over the final half of 1932.

Company officials say that in the refrigerator division, January and February (1934) sales were greater than sales during all of 1933.

Montgomery Ward & Co.

CHICAGO—Montgomery Ward & Co. turned a deficit of $5,686,784 in 1932 into a net profit of $2,227,957 in 1933, Sewell L. Avery, president, reported to stockholders March 19.

Net sales increased from $165,943,211 for 12 corresponding months of 1932 to $187,632,543 last year, a gain of 13 per cent. 1932 was a 13-month fiscal year.

The retail stores division operated at a profit of $2,857,587 in the 12 months ended Jan. 31, 1934, against a loss of $2,898,722 in the 13 months previous; the mail order division cut its loss for the same periods from $3,211,985 to $207,567.

Avery said the company's current assets Jan. 31 last totaled $88,644,891 and its current liabilities $10,169,212. The balance sheet showed $11,162,236 cash and $14,232,410 securities, chiefly government bonds.

No rest for the Cash Register behind a
MONEL METAL BAR
...Brunswick-Balke-Collender rings the bell
Advance notes on
1933 BAR STYLES
emphasize silvery
MONEL METAL!
Monel Metal advertising appears regularly in The Saturday Evening Post, Collier's, Ladies' Home Journal, Good Housekeeping, House & Garden, Time and Nation's Business. Total circulation, over ten million per issue. Also in 55 business publications.
What the WELL DRESSED BAR WILL WEAR .... and HOW!
Plan for future profits with inviting MONEL METAL!
MONEL

MILLIONS OF MESSAGES all selling ONE material...

a material for bars...for refrigerators

THAT'S RIGHT...millions of advertising pages. All devoted to Monel Metal. And the majority of them *playing up* the manufacturer who uses Monel Metal in his product.

Here's sales power

The biggest advertising push ever put behind *any* material used in bars and refrigerators.

Reaches the entire hotel, club and restaurant field. (Not to speak of institutional food service coverage as well.)

Explains why Monel is the preferred metal for so many of the new bars.

Why hotel men...who have used Monel for food service installations for years..."can't see anything else."

Why experienced restaurateurs prefer Monel Metal.

And why taverns, beer gardens, and tap rooms use this superlatively fine material.

No wonder Monel is first choice

Stubbornly resists corrosion...from beer, wines and liquors...oranges, lemons, and limes...eggs, fruit juices and syrup...carbonated water, cleansers, and other common acid or alkaline sources of corrosion.

Easy and quick to clean, and to keep clean.

Strong as steel, yet cannot rust, and withstands denting from steins, seidels, and bottles...utensils, jars and ice.

Looks like silver. Monel Metal has the soft quiet beauty of burnished silver and its good looks are everlasting.

Solid metal clear through...no surface coating to crack, chip or wear off.

Proved for food service equipment

Monel Metal has been the *standard of quality* for food service installations in the leading hotels and restaurants for 25 years...*and for bar and tap room installations in famous foreign hotels and ocean liners all during the dry era.*

Get the latest facts about Monel Metal in beverage service. A 16-page book is now on the press. Reserve your copy today. Ask for "SMART BARS". Write:

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York, N. Y.

Monel Metal is a registered trademark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

MONEL
the Metal for Bars

RADIO!! ★ DIRECT MAIL! ★ SALES COACH!! ★ OUTDOOR POSTING! ★ MOTION PICTURES!!
COOKING SCHOOLS ★

THE SATURDAY EVENING POST

GENERAL ELECTRIC PRESENTS
two new 1934 G-E Refrigerators!

Now...distinguished style joins matchless mechanism

LONG THE OUTSTANDING LEADERS in mechanical performance, General Electric refrigerators now offer you new brilliant beauty in modern styling. You will instantly recognize in these de luxe models the most attractive cabinet designs ever presented in electric refrigerators. Faultless in simplicity of line, with new refinements and inherent General Electric quality, these aristocrats of style are winning the enthusiastic plaudits of the most discriminating buyers.

Take Your Choice!

Within the smooth gleaming walls of the beautiful new Monitor Top is the same famous sealed-in-steel mechanism that made refrigerator history. Its record of trouble-free, dependable refrigeration service at lowest cost is unparalleled. Built for a lifetime . . . requiring no attention, not even oiling . . . the distinctive G-E Monitor . . . is universally recognized as the Standard of Excellence.

The new de luxe G-E flat top model steps far ahead of all conventional type refrigerators. Smartest in style . . . finest in cabinet appointments . . . it lends a new modern note to your kitchen of today, and fits perfectly into the style theme of the kitchen of tomorrow. Here's new beauty of design, convenience features and performance capacity to be found in no other popular priced model.

See these style leaders at your General Electric refrigerator dealer's, and also note the complete line of standard G-E Monitor Top and flat top models, size and price to meet every requirement.

For your nearest dealer see "Refrigeration Electric" in the classified pages of your telephone book. General Electric Co., Specialty Appliance Sales Dept., Section S31, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC

GENERAL ELECTRIC FEATURES

So quiet in operation you can scarcely hear it. Uses less current and gives full refrigerating capacity for even unusual demands.
Sturdy All-Steel cabinets with glistening white enamel exterior, or gleaming porcelain both inside and out.
Sliding shelves, adjustable in height, giving more conveniently usable storage space.
Stainless steel freezing chamber, cannot chip or rust, freezes more ice faster.
Convenient temperature control for fast freezing, refrigeration ... defrosting.
Automatic interior lighting ... entire interior when door ...
Auxiliary foot-pedal ... ber, easily replaced ...
Door gaskets ...
New ... our Top models completely equipped ... covered glass food containers, chiller tray ... and vegetable pan.

Modernize your home with TEN 10 BEST HOME SERVANTS ... G-E MAZDA Lamps • G-E Hot Furnace • G-E Water Heater • G-E Kitchen Cleaner • G-E Dishwasher • G-E Refrigerator • G-E Range • G-E

G-E—LA SALLE SALES TRAINING
WINDOW DISPLAYS!

"SEE THESE STYLE LEADERS AT YOUR G-E DEALER'S"

GENERAL ELECTRIC'S big spring sales drive is under way! In this week's issue of the Saturday Evening Post, with a two-page spread advertisement in full colors, and in other national magazines, General Electric breaks the news to millions about the sensational new G-E de luxe refrigerators. Millions more will hear and read about them in newspapers, radio, billboards, direct-mail and other timely sales promotion activities.

The entire campaign is designed *to direct the buying public to the G-E dealer's store.* It's going to be a BIG season for General Electric refrigerator dealers! Long the outstanding leaders in mechanical performance, General Electric refrigerators now offer, in these two new de luxe models, a new conception of modern refrigerator styling. Together with the standard lines of G-E Monitor Top and Flat Top models, they will bring in sales and profits to General Electric dealers in record-breaking volume!

General Electric invites you to share in this business—to get in on the *receiving end* of the greatest sales drive in all G-E history! If you are not now a G-E dealer, wire or write today for details of the General Electric refrigerator franchise. Address General Electric Co., Electric Refrigeration Department, Section DF 32, Nela Park, Cleveland, Ohio.

GENERAL ELECTRIC
ALL-STEEL REFRIGERATORS

Kelvinator Appoints 134 New Retailers

DETROIT — A total of 134 new dealer appointments were announced last week by Kelvinator Corp.

Among those who have been added to the list of dealers handling the Kelvinator line are the following:

Stimson's Electric Shop, Waterville, Me.; G. A. Lawrence Co., Rockland, Me; Jackson-Riedle, New Britain, Conn.; Frank Stein & Sons, Holyoke, Mass.; Luther White, Inc., Rockville, Conn.; Dempsey & Leary, Inc., Windsor Locks, Conn.; Ottenheimer Bros., Inc., Baltimore, Md.; Edward Legg., Pascoag, R. I., C. Phil Speller, 613 Erie Blvd. E., Syracuse, N. Y.; Ferguson's, New Rochelle, N. Y.

Stern Brothers, 41 W. 42nd St., New York City; Westco Refrigeration Service, Inc., Mt. Vernon, N. Y.; Burden's Dept. Store, Jamaica, N. Y.; Electrical Sales & Service Co., Greenwich, Conn.; Abraham & Straus, Brooklyn, N. Y.; Adirondack Sales Co., Warrensburg, N. Y.; Anderson Furniture & Radio Store, Fort Henry, N. Y.; Chatham Auto Sales Co., Chatham, N. Y.

Jackson & Boome, Coxsackie, N. Y.; Miller Electric Service, 91 Center St., Ellenville, N. Y.; Bennett Radio Shop, South River, N. J.; D. J. Porreca Bros., Inc., Philadelphia, Pa.; Maurice Mandelkern, Philadelphia, Pa.; Dynamic Radio Co., Philadelphia, Pa.; Locust Radio Repair, Inc., Philadelphia, Pa.; Nathan Birdman, Philadelphia, Pa.; Israel Wolkins, Philadelphia, Pa.; Vencent Castelli, Philadelphia, Pa.

C. G. Landis, Nottingham, Pa.; Radio Shop, Petersburg, W. Va.; Boyd J. McWhorter, Moorefield, W. Va.; George R. Broadt, Hellam, Pa.; F. F. Kling, Manchester, Pa.; Wm. M. Mummert, Dover, Pa.; C. F. Shutter & Son, Wrightsville, Pa.; L. B. Lau & Son, Glen Rock, Pa.

Troup Bros., Harrisburg, Pa.; Root Dry Goods Co., Terre Haute, Ind.; Vanderwoude Radio Electric Shop, Kalamazoo, Mich.; Miles Miller, Sturgis, Mich.; Stanley K. Wood, Kalamazoo, Mich.; E. J. Ulmer Appliance Store, New Washington, O.; Ward H. Stutz Furniture Store, Arcanum, O.; Pearson Piano Co., Indianapolis, Ind.; Ice Hardware Co., Hagerstown, Ind., and New Castle, Ind.

J. A. Kern & Son, Frankfort, Ind.; Symmes & Williams Electric, Inc., Crawfordsville, Ind.; Baugh and Garner, Inc., Danville, Ky.; Fred Tichenor, Shelbyville, Ky.; Hugh Witt, Winchester, Ky.; Virgil W. Fordyce, Cambridge, O.; Rithner Transit Co., Inc., Wellsburg, W. Va.; Peterson & Gustafson, Cochranton, Pa.; Walter H. Ellis, Corry, Pa.; Tucker & Major Service, Albion, Pa.; Winter Piano Co., Erie, Pa.; Hostettler Electric Store, Edinboro, Pa.; Long & Co., Portsmouth, O.; Bailey's Electric Shop, Paintsville, Ky.; T. C. Farnham Supply Co., Harriman, Tenn.; N. E. Mason, Terra Alta, W. Va.; Lick Branch Colliery, Switchback, W. Va.; Snyder Electric Co., S. Lakewood, O.; Page Coal & Coke Co., Pageton, W. Va.; Bottom Creek Colliery, Vivian, W. Va.

Finerock Brothers Co., Canal Fulton, O.; Pocahontas No. 30 Colliery, Amanota, Va.; Schweel Furniture Co., Lynchburg, Va.; A. P. Wood, Kimball, W. Va.; Sheffield Electric Co., Homestead, Fla.; Pulaski Iron Co., Eakman, W. Va.; J. C. P. Heinz, Selma, Ala.; Duke Brothers Furniture Co., Inc., Birmingham, Ala.; Norfolk Colliery, Mayberry, W. Va.; Cleveland Furniture Co., Cleveland, Tex.

Clark & Jones, Inc., Birmingham, Ala.; Conroe Furniture Co., Huston, Tex.; Frank Wright, Port Arthur, Tex; A. R. McLean, Houston, Tex.; Walker-Matchett Co. Bay City, Tex.; D. H. Holmes Co., Ltd., New Orleans, La.; Lockport Light & Power Co., Lockport, La.; Decatur Music Shop, Decatur, Ill.; Benton County Utilities Co., Gravette, Ark.

Diggs Hardware & Furniture Co., Paris, Tenn.; Ozment Motor Co., Dyersburg, Tenn.; Williams Motors, Jackson, Tenn.; J. C. Appleby, Blytheville, Ark.; Riggs Motor Co., Inc., Leachville, Ark.; S. S. Miller & Sons, Russell, Kans.; Lyon Bros., Chetopa, Kans.; Marx Music Store, Emporia, Kans.; Caldwell Electric Co., Goodland, Kans.; Kraemer Hdwe. Co., Marysville, Kans.

Reed Hdwe Co., Larned, Kans.; Lee Hdwe. Co., Glen Elder, Kans.; Pratt Hdwe. Co., Colby, Kans.; Raskop's Hdwe. Co., Quintu, Kans.; W. R. Earl Furniture Co., Austin, Minn.; Kelvinator Suburban Sales & Service, River Forest, Ill.; J. F. Buschena, Fulda, Minn.; Claude P. Felts, Tilleda, Wis.; A. F. Baeseman, Edgar, Wis.; Gasser Bros., Boscobel, Wis.

Quentmeyer Bros., Columbus, Wis.; Koerner & Pingel Hdwe. Co., Watertown, Wis.; Kremer Furniture Co., Fond du Lac, Wis.; Alfred J. Johnson, Cedar Rapids, Ia.; Rukgaber Hdwe., Washington, Ia.; Cedar Rapids Kelvinator Co., Cedar Rapids, Ia.; Henderson & Son, Winterset, Ia.; C. A. Labor Electric Co., Dallas Center, Ia.; Garlock Sales Co., Fort Dodge, Ia.; Thos. N. Webb, Guthrie Center, Ia.

Webster City Maytag, Webster City, Ia.; Forsyth's Hdwe., Colfax, Ia.; C. W. Cottrell Hdwe. Co., Washougal, Wash.; Kaufman Leonard Co., Olympia, Wash.; Fitzgerald Furniture Co., LaGrande, Ore.; Fitzgerald Furniture Co., LaGrande, Ore.; I. R. Johnston, Coeur D' Alene, Ida.; Crockett Hdwe. & Furniture Co., Orofino, Ida.; Dissmores', Kamiah, Ida.

St. John Hdwe. & Implement Co., St. John, Wash.; Meier & Frank Co., Portland, Ore.; Banks Paint Store, Globe, Ariz.; P. L. Davis Furniture Co., Edgerton, Wyo.; Refrigerating Equipment & Supply Co., San Bernardino, Cal.; Thompson & Ducey, Fresno, Cal.; Moffatt Electric Co., Needham, Mass.; A. L. Svenden, Jamaica, N. Y.; Muscatine Music House, Muscatine, Ia.

200,000 Attend Kroger-Westinghouse Schools

MANSFIELD, O.—In the first 22 weeks of its tour, the Kroger-Westinghouse cooking school has played before audiences totalling almost 200,000 women, officials in charge declare.

Plans are now being laid for an even more extensive schedule for the 1934-1935 season.

Prosit!

This stein, insulated with Dry-Zero, keeps beer cold longer than the average container.

* * *

Dry-Zero Insulated Stein Marketed

ST. LOUIS—Designed for the increased pleasure of slow imbibers of beer and to enhance the reputation of proprietors of beer dispensing establishments, Drico, Inc., has introduced a Dry-Zero insulated stein warranted to keep its contents cold more than twice as long as will an ordinary glass stein.

The Drico stein consists of an anodic aluminum cup mounted in a bakelite shell. In the space between cup and shell is a layer of Dry-Zero.

That the Drico stein does its job is indicated by tests conducted in the Dry-Zero high temperature test room. Four steins, one glass, another copper, another crockery, and the Drico —were tested simultaneously. Each stein was filled with 5 oz. of cracked ice and the room temperature set at 100° F. with 93 per cent relative humidity.

The ice in the glass stein melted in exactly one hour. In the varnished copper stein, it lasted only 47 minutes, while in the crockery container it melted in 68 minutes. In the Drico stein, two hours and 10 minutes elapsed before the ice vanished. It was also found that 75 per cent more water vapor collected on the outside of the glass stein than on the Drico stein.

Sunday Meeting Held By Gibson Distributor

ALBANY, N. Y. — So its dealers would lose no working-day time in their territories, the Capital City Distributing Corp. here helds its annual conclave for retailers on Sunday, Feb. 25 to introduce 1934 Gibson refrigerators, RCA-Victor radios, and Automatic washers.

Max E. Hegleman, sales manager of the distributorship, presided at the meeting, and Max Landay, general manager, bade the dealers welcome. Harry C. Brown, New York manager for the RCA Radiotron Co., presented the new micro-sensitive RCA Radiotrons and told of the manufacturer's sales plans.

Frank S. Gibson, vice president of the Gibson Electric Refrigerator Corp. in Greenville, Mich., and Herbert E. Young, eastern sales manager of the company introduced the 1934 Gibson line and described new factory merchandising aids for retailers.

Homer-King Is Distributor For Servel in Tacoma

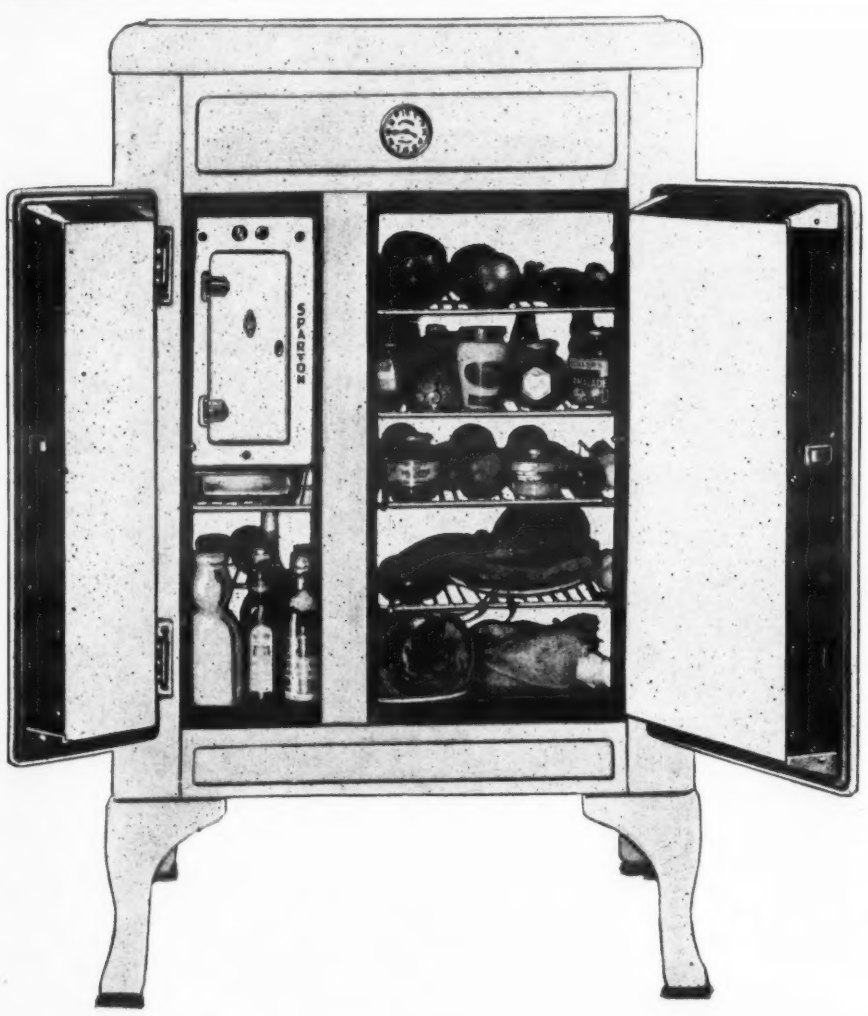
TACOMA, Wash. — Announcement has been made by Servel, Inc., of the appointment of Homer-King, Inc., local wholesalers, as distributor of the Servel line of commercial refrigeration and air-conditioning equipment in the northwest territory.

Portland Newspaper Uses Grunow in Model Kitchen

PORTLAND, Ore.—A Grunow refrigerator has been installed in the model kitchen and demonstration laboratory just completed by the *Portland Oregonian,* nationally known newspaper of this city.

Dealer Signs Franchise & Orders Two Carloads

EL CENTRO, Calif.—Imperial Valley Hardware Co. here signed a Norge dealer franchise last week, and made its initial order one for two carloads of Norge refrigerators.



YOUR TIME TO MAKE MONEY

This Revolutionary

ANTIFROST *Electric* CLOCK

Will beat time to a tune of *greater sales* for SPARTON DEALERS in 1934

● For 1934 Sparton introduces a new All-Feature refrigerator with a revolutionary new sales feature —*the Antifrost Electric Clock.* While the family sleeps, this watchdog of electric light bills does its defrosting job and in the morning Sparton is ready for the day's work. No trouble, no thought, no worry. This unique feature eliminates frosty coils which prevent proper air circulation. Housewives want the complete features of the Sparton. They like the beautiful design and the spacious, well arranged interiors. With the new Antifrost Clock which automatically cuts down ordinary refrigerator operating costs, they want the Sparton more than ever.

20 million families use Sparton products, with the list increasing at the rate of 6000 new users a day. Sparton is known the country over for its high type of product and craftmanship.

Sparton is the line of refrigerators to sell in 1934 if you are looking ahead toward cashing in on the general upward swing in business. Sell a known quality product — a product with sales appeal — a product backed by a sound merchandising plan—a product backed by a sound refrigerator manufacturer — a product that gives you a square deal — SELL THE 1934 SPARTON. Write for details. The Sparks-Withington Company, Jackson, Mich. Sparton of Canada, Ltd., London.

20 million Sparton users

SPARTON

TUNE IN Sunday Afternoons 3 to 3:30 E.S.T. on N.B.C. Blue Network. Hear the interesting Sparton Program.

All-Feature Refrigerator

Auto Industry Boom Aid to Refrigeration, Blood Says over NBC

DETROIT—Belief that the electric refrigeration industry is benefitting materially from the current spurt in automobile sales was expressed by Howard E. Blood, president of Norge Corp. here, in a radio interview broadcast the night of March 10 over 20 N.B.C. stations.

"Throughout the years of depression, automotive manufacturers continued experimentation involving expenditure of millions of dollars. The result of these experiments can be seen today in the values their cars offer, values the public finds exceedingly difficult to resist," said Mr. Blood.

This question was asked of Norge's president: "Do you believe the electric refrigeration industry is sharing in the prosperity created by the automobile industry, although your product is not directly associated with that industry?"

His answer: "The electric refrigeration industry is peculiar. Actually, we have not felt the depression very much, apparently because our product has met a need of which the public is now conscious—better food preservation—and has at the same time introduced economies into the home which have made the purchase of electric refrigerators very easy.

"But that we and everyone else are profiting from the sale of automobiles is self evident. We cannot sell electric refrigerators to unemployed people, and because vast numbers are directly dependent upon the automobile industry for support, it is evident that when these people are working, our market, like everyone else's market, is tremendously increased."

Gar Wood Industries Changes Name

DETROIT — Gar Wood's various manufacturing activities, including the air-conditioning division, which have been conducted for the past twenty-two years as the Wood Hydraulic Hoist & Body Co., will henceforth be known as Gar Wood Industries, Inc., according to Logan T. Wood, vice president and general manager in charge of all Gar Wood operations.

The new company, however, does not include Gar Wood, Inc., Marysville, Mich., at which plant are produced the Gar Wood water craft, comprising a complete line of stock models of runabouts. The boat plant, while affiliated with Gar Wood Industries, Inc., will remain as an entirely separate organization.

Townley Co. to Distribute Servel in Kansas City

EVANSVILLE, Ind.—Townley Metal & Hardware Co. of Kansas City, Mo., has been named distributor for Servel air-conditioning and commercial refrigeration equipment, negotiations for the franchise having been completed recently by C. R. Porter, Servel district sales representative, and W. Paul Jones, Servel's advertising and sales promotion manager.

The Townley Co. will celebrate its fiftieth anniversary this year.

185 Iowa Dealers Meet To Inspect New Grunow

DES MOINES, Ia.—C. L. Carper of Lincoln, Nebr., and J. W. Sherry of Omaha, Nebr., respectively president and vice president of the Sidles-Duda-Myers Co., flew here to attend a meeting recently at which 185 Grunow dealers viewed the new Grunow refrigerators.

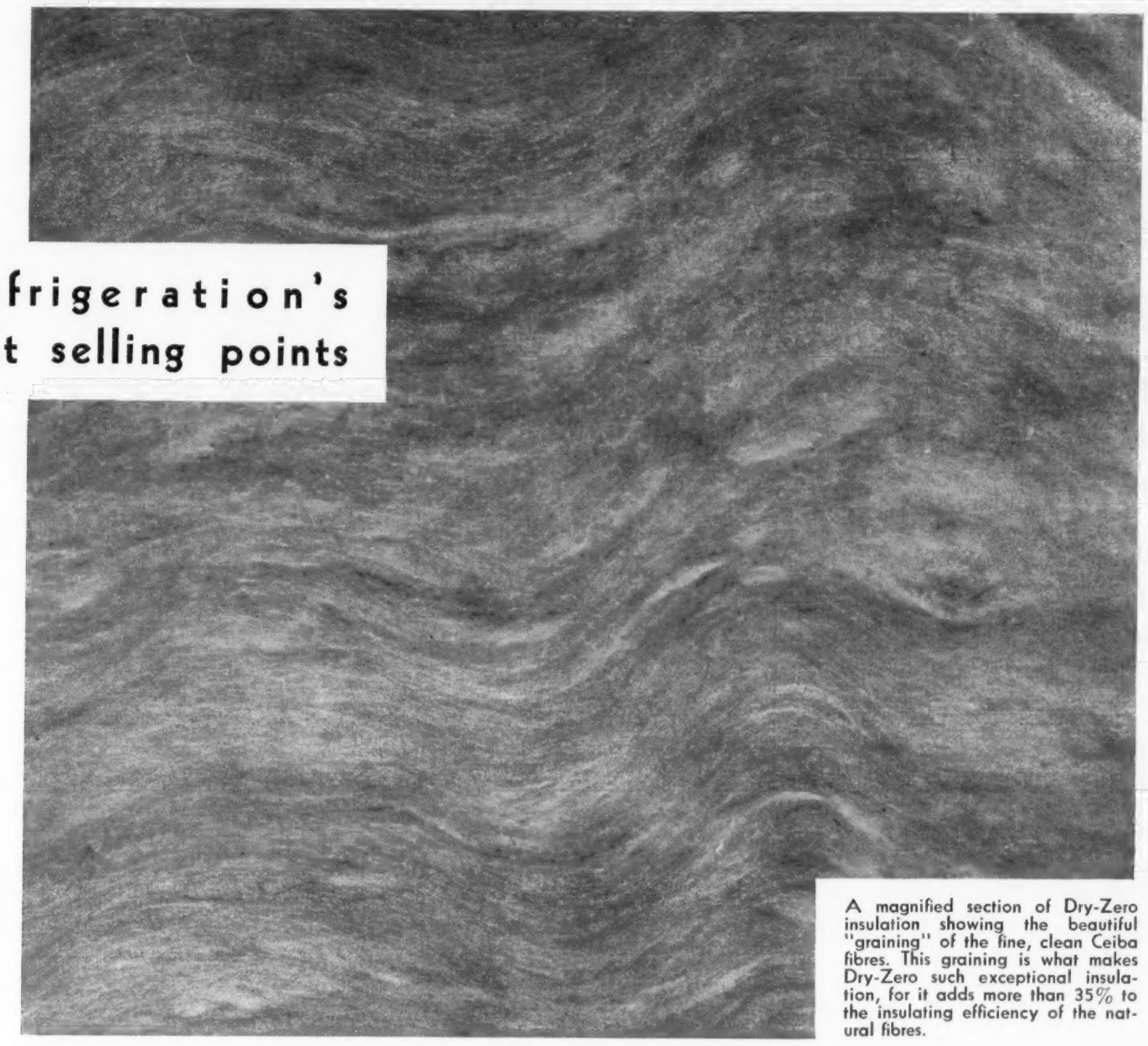
The local branch of Sidles-Duda-Myers Co. is Des Moines distributor for Grunow. Presiding at the meeting was M. J. Murphy, branch manager. Factory officials in attendance included J. H. Rasmussen, assistant sales manager; H. T. Stockholm, district manager; and J. F. Vulter, of the engineering department.

Refrigerator Accessories Shown in California

SAN FRANCISCO—Refrigerator accessories and parts were displayed in a series of shows conducted recently by Clarence F. "Sandy" Pratt, president of the California Refrigerator Co., manufacturers' representative of this city. The shows were open to the public.

First of the series was held March 5 and 6 at the Casa de Vallejo Hotel, Vallejo. The second was held March 7, 8, and 9 at the Hotel Senator, Sacramento, and the third show was held March 10, 11, and 12 at the Hotel Stockton, Stockton. Similar exhibitions are being planned for other cities in northern and central California.

One of refrigeration's most important selling points



A magnified section of Dry-Zero insulation showing the beautiful "graining" of the fine, clean Ceiba fibres. This graining is what makes Dry-Zero such exceptional insulation, for it adds more than 35% to the insulating efficiency of the natural fibres.

- - this insulation that makes good refrigeration permanent

High quality insulation is one of the most important elements of a good refrigerator. Without good insulation, no refrigerator can operate economically or give satisfactory service for any reasonable period.

Poor insulation throws the burden of maintaining proper temperatures entirely on the operating mechanism. Unless the job is over-powered, this means premature failure of machine parts or utter failure to give sufficient refrigeration—in any case, high operating costs.

Salesmen who tell the story of Dry-Zero insulation find it one of their best selling points, for it shows the prospect clearly why the refrigerator in which Dry-Zero is used gives long, economical and always satisfactory refrigeration.

Dry-Zero is made with the fibres from the seed pods of a tropical tree which have natural high insulating efficiency. By an exclusive air "graining" process, the Ceiba fibres are laid parallel across the line of heat flow. This graining of the fibres adds more than 35% to the insulating qualities of the resulting Dry-Zero batt and provides the most efficient commercial low temperature insulation available.

Furthermore, the natural absorption-proof quality of the Dry-Zero batt and the almost vapor-proof container in which it is enclosed for use in a refrigerator, insure full insulating efficiency for the life of the box.

Try using this effective selling story. If you would like more complete details, write for the circular "What is Dry-Zero?" It means a sure boost in refrigerator sales.

Dry-Zero Corporation, Merchandise Mart, Chicago, Illinois.
Canadian Office, 687 Broadview Avenue, Toronto, Ontario.

NRA MEMBER U.S. WE DO OUR PART

DRY·ZERO

THE MOST EFFICIENT COMMERCIAL INSULANT KNOWN

AIR CONDITIONING

Characteristics of Freon Refrigerant Given For Commercial Refrigeration and Air Conditioning

By R. J. Thompson, Refrigerating Engineer, Kinetic Chemicals, Inc.*

THE refrigerant Freon is not an accidental discovery, but is the result of years of a careful and deliberate attempt to produce a compound which would be non-hazardous and practical from a mechanical standpoint. Up to the advent of Freon there was no known refrigerant which was non-flammable and non-toxic. A specification for the ideal refrigerant was prepared, incorporating all desirable features (about 35 in number), and work was started on the problem of finding such a material.

Certain of the known compounds which date back to the Fourteenth Egyptian Dynasty and also to the time of Homer were investigated and their properties determined. New families of compounds were searched for and produced, and all but one were eliminated as they were found wanting in one or many respects.

Out of this search did come a new series of compounds which more nearly approached the idea than any other known material. These were halo-fluoro derivatives of aliphatic hydrocarbons, of which dichlorodifluoromethane, trichloromonofluoromethane, and dichlorotetrafluoroethane were members. These compounds were the first refrigerants developed specifically for refrigeration purposes.

To save time in speaking and writing, and embarrassment in pronunciation and spelling, a code was set up using letters and numerals such as F-12, F-11 and F-114. For the reason that we always had to explain what F-12 meant, we have since given F-12 the name of Freon. (How Freon got its name).

Now let us see how well Freon fulfills these specifications as drafted ten years ago. I cannot dwell too long on each individual point at this time, but will furnish additional details on any of the data presented here.

Odor

Freon is odorless at concentrations of less than 20 per cent by volume in air, which is equivalent to the release and vaporizing of 63 lbs. of liquid into a confined space of 1,000 cu. ft. At concentrations higher than 20 per cent the odor of Freon is very mild and similar to that of carbon tetrachloride.

Freon vapor in all proportions is non-irritating to the eyes, nose, throat and lungs, and being odorless and non-irritating, eliminates the chance of a panic hazard should it escape from an air conditioning, commercial, industrial, or household system.

Systems that have been installed, whether they be of the small household size using low-pressure float-valve flooded systems of 1/20-ton capacity or large air conditioning installations of up to 2,000 tons capacity, would not produce sufficient concentration of vapor-air mixture (less than two per cent or six lbs. per 1,000 cu. ft.) to be detected by smell should the entire charge be released into the kitchen or the entire building.

This feature is particularly valuable for air-conditioning systems where the air to be conditioned passes over evaporators containing the refrigerant. Such systems are not in general use as yet in large buildings, although some installations of up to 100 tons capacity have been made and are also used in railway cars and private rooms as coolers.

Flammability and Explosiveness

Freon liquid or vapor is non-flammable and non-combustible as Freon-air mixtures are not capable of propagating a flame. In fact, Freon may be employed for fire extinguishing purposes as it is equivalent in this repect to carbon tetrachloride.

The U. S. Bureau of Mines have issued a pamphlet R. I. 3042 showing the flame-extinguishing properties to be more than twice as good as carbon dioxide, more than four times that of nitrogen, four and one-half times that of helium and almost seven and one-half times that of argon. Since Freon is non-flammable and non-combustible, the use of it eliminates possibilities of fire or explosion hazard.

Corrosiveness

Freon is non-corrosive to all metals used in refrigeration apparatus, and this feature permits the manufacturers a wide selection of materials with which to design and produce efficient condensers, evaporators, compressors, control apparatus, and pipe lines.

We do not recommend the use of magnesium alloys or aluminum containing magnesium in systems where water may be present, as corrosion will result. The water or water vapor has a high corrosive effect on such materials, but this corrosion is neither accelerated nor retarded by the presence of Freon.

Molded packing and sheet gasket materials vary widely in composition, with the result that the safe use of such materials can only be determined after sufficient test. There are a number of manufacturers who are in position to supply the proper materials that will insure long life, performance, service and stability.

Freon is stable and inert and will indefinitely withstand repeated evaporations, compressions and condensations without disassociation. The temperature required to cause breaking down (1,022° F. dull red heat, see Underwriters' Laboratories report M. H. 2256) is very much higher than any temperature obtained within refrigerating apparatus, even under most abnormal conditions.

*Talk given before the Detroit Section of the American Society of Refrigerating Engineers, March 5, 1934.

Effect on Foods, Flowers, Furs or Fabrics

Freon liquid or vapor is not absorbed by and has no effect on any materials being refrigerated, and has no effect on the odor, taste, color, or structure of foods. Freon vapor has no effect on the odor, color, continued blooming, or structure of flowers or plant life. Freon has no effect on the color or structure of furs or fabrics.

Toxicity

It is now known that Freon is less toxic than carbon dioxide. This is a remarkable fact in itself as prior to April 1930 it was not known to the scientific public that there was a gas possessing valuable properties as a refrigerant that was less toxic than carbon dioxide.

It is an established fact that Freon, F-114, and F-11 as such are the least toxic refrigerants that have yet been discovered. Permit me to quote from the recent Underwriters' Laboratories report M.H. 2375, which reads:

"Dichlorodifluoromethane appears to show no toxic effect in concentrations up to at least 20 per cent by volume (63 pounds per 1,000 cu. ft.) for durations of exposure of the order of two hours. In tests with concentrations of the order of 28.5 to 30.4 per cent by volume (89.6 to 95.7 pounds per 1,000 cu. ft.) for durations of exposure of the order of two hours, some physiological action is apparent, but whether or not this is caused primarily by oxygen deficiency is not shown in our data."

Undoubtedly the large amount of Freon that was used to cause the apparent physiological action reduced the oxygen content of the test room from 20½ per cent, which is considered normal, to 14.3 per cent, which is below the amount required to sustain life for long periods.

In the U. S. Bureau of Mines report R. I. 3013 it is reported that animals live for an indefinite period of time in an atmosphere of 20 per cent Freon gas. In fact, pregnancy and bearing normal young were as frequent among animals exposed to Freon as among the controls; also, that autopsies performed on all animals revealed no gross pathology attributable to exposure to Freon.

We have a chart listing various refrigerants used in the recent Underwriters' test, which shows the percent concentration or the number of pounds of refrigerant to be released which will kill or seriously injure guinea pigs. This chart was prepared for ready reference merely to show the non-toxic properties of the refrigerant we are discussing.

Decomposition

Every chemist knows that when an organic compound is exposed to high temperatures it will decompose into other chemicals. This is elementary chemistry. Freon, in common with all other organic compounds, decomposes into its halogen acids on passage through a naked flame of high temperature. The conditions required to produce decomposition products that

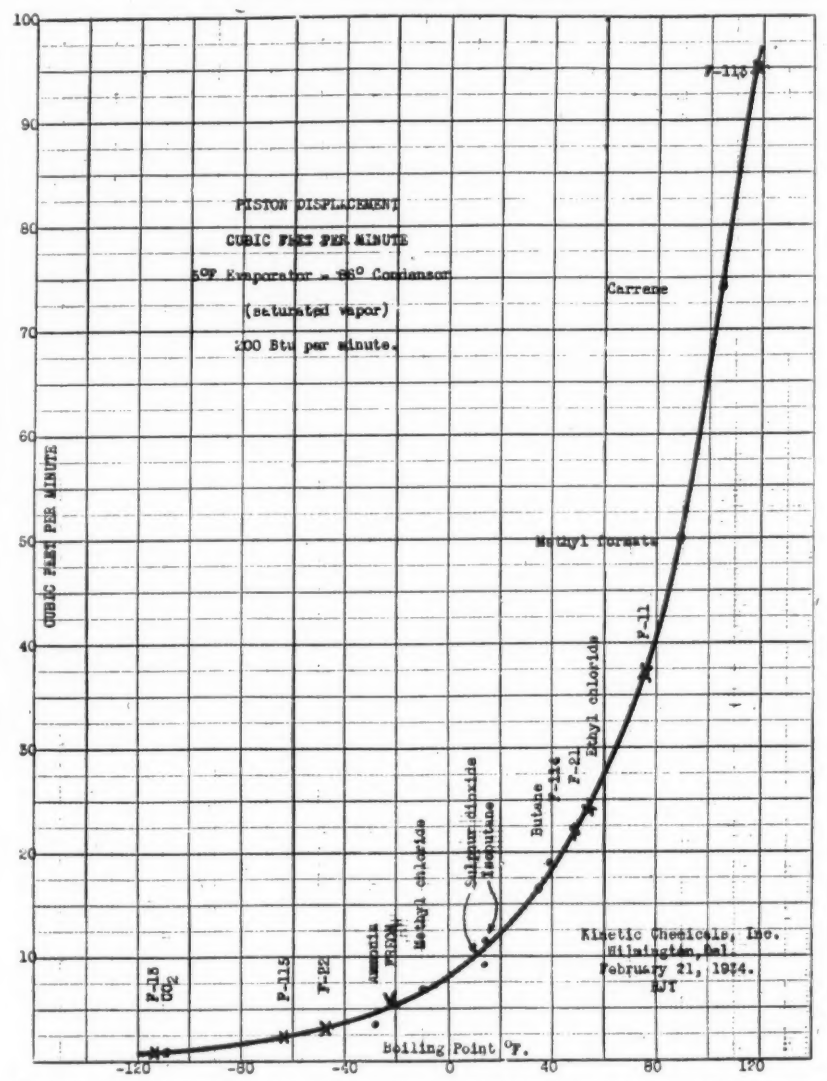
(*Continued on Page 9, Column 1*)

Toxicity Chart, lbs. per 1000 cu. ft.

	PERCENT CONCENTRATION AT 20°C - 68°F Pounds per 1000 cu.ft.											
	1/4#	1/2#	1#	2#	3#	4#	5#	6#	7#	10#	15#	20#
Ammonia	.56	1.13	2.26	4.52	6.78	9.04	11.3	13.6	15.8	22.6	33.9	45.2
Carbon Dioxide	.22	.44	.875	1.75	2.65	3.5	4.38	5.25	6.13	8.75	13.1	17.5
Methyl Chloride	.19	.38	.762	1.52	2.28	3.04	3.81	4.57	5.33	7.62	11.4	15.2
Methyl Formate	.16	.32	.641	1.28	1.92	2.56	3.2	3.84	4.48	6.41	9.6	12.8
Sulphur Dioxide	.15	.30	.601	1.2	1.8	2.4	3.0	3.6	4.2	6.01	9.0	12.0
Ethyl Chloride	.149	.298	.596	1.19	1.79	2.38	2.98	3.57	4.17	5.96	8.9	11.9
Methylene Chloride	.115	.226	.453	.91	1.36	1.81	2.26	2.72	3.17	4.53	6.8	9.07
Methyle Bromide	.101	.203	.405	.81	1.22	1.62	2.03	2.43	2.84	4.06	6.09	8.1
Dichlorethylene	.099	.20	.397	.79	1.19	1.59	1.98	2.38	2.78	3.97	5.96	7.95
Ethyl Bromide	.088	.18	.353	.71	1.06	1.41	1.76	2.22	2.47	3.53	5.3	7.06
Chloroform	.081	.17	.322	.64	.97	1.33	1.66	1.99	2.32	3.22	4.8	6.44
Freon	.08	.16	.318	.63	.96	1.27	1.59	1.91	2.22	3.18	4.7	6.37
F-11	.07	.14	.28	.56	.84	1.12	1.40	1.68	1.96	2.80	4.2	5.60
Carbontetrachloride	.06	.13	.25	.5	.75	1.0	1.25	1.5	1.75	2.50	3.75	5.0
F-114	.056	.11	.225	.45	.68	.9	1.12	1.35	1.57	2.25	3.38	4.5

Shaded portions of this chart show the percentage of concentration for various refrigerants released in a 1,000-cu. ft. space which seriously injure or are fatal to guinea pigs.

Piston Displacement



Piston displacement (cu. ft. per minute) of various refrigerants producing one A.S.R.E. standard ton of refrigeration.

Concentrations of Various Refrigerants Which Are Fatal to Guinea Pigs

	Formula	Cu.Ft. Per Lb. of gas or Vapor 20°C - 68°F	Percent Concentration: Oxygen Content 20.4%	20.3%	20.1%	20.0%	19.45%	18.45%	17.4%	16.4%	15.35%	14.35%	Kills or seriously injures Guinea Pigs — Concentration in Air: Per Cent By Vol.	Pounds Per 1000 cu.ft.	Duration of Exposure	Explosive Range: Concentration in Air - Percent By Volume	Pounds per 1000 cu.ft.
			1/2%	1%	2%	2½%	5%	10%	15%	20%	25%	30%					
Ammonia	NH_3	22.6	.221	.444	.887	1.107	2.214	4.43	6.64	8.86	11.07	13.28	.5 to .6	.221 to .256	1/2 hour	16 to 25	7.1 to 11.0
Illuminating Gas		20.46	.244	.489	.978	1.222	2.445	4.89	7.34	9.78	12.22	14.66	-	-	-	5 to 31	2.44 to 15.1
Ethane	C_2H_6	12.81	.390	.780	1.56	1.95	3.9	7.8	11.71	15.6	19.46	23.4	-	-	-	3.3 to 10.6	2.57 to 7.81
Carbon Dioxide	CO_2	8.75	.572	1.143	2.29	2.86	5.72	11.44	17.15	22.90	28.6	34.3	29 to 30	35.2 to 34.3	1/2 to 1 hour	-	-
Propane	C_3H_8	8.73	.573	1.145	2.295	2.867	5.73	11.5	17.2	23.0	28.7	34.4	-	-	-	2.3 to 7.3	2.6 to 8.35
Methyl Chloride	CH_3Cl	7.62	.656	1.313	2.625	3.28	6.57	13.15	19.7	26.30	32.8	39.4	2 to 2.5	2.62 to 3.28	2 hours	8.1 to 17.2	10.6 to 22.6
Butane	C_4H_{10}	6.62	.755	1.510	3.020	3.775	7.56	15.1	22.7	30.20	37.8	45.3	-	-	-	1.6 to 6.5	2.42 to 9.84
Methyl Formate	$C_2H_4O_2$	6.41	.780	1.560	3.12	3.90	7.80	15.60	23.4	31.2	39.0	46.8	2 to 2.5	3.12 to 3.90	1 hour	4.5 to 20	7.02 to 31.2
Sulphur Dioxide	SO_2	6.01	.833	1.665	3.33	4.17	8.33	16.65	24.98	33.3	41.6	49.9	.7	1.165	5 minutes	-	-
Ethyl Chloride	C_2H_5Cl	5.96	.840	1.680	3.36	4.20	8.4	16.8	25.2	33.6	42.0	50.4	4	6.72	1 hour	3.7 to 12	6.21 to 20.1
Methylene Chloride	CH_2Cl_2	4.55	1.10	2.210	4.42	5.52	11.05	22.1	33.1	44.2	55.2	66.3	5.1 to 5.3	11.25 to 11.70	1/2 hour	-	-
Methyl Bromide	CH_3Br	4.05	1.235	2.470	4.93	6.17	12.35	24.7	37.0	49.3	61.6	74.0	.7 to 1.0	1.73 to 2.47	1/2 hour	-	-
Dichlorethylene	$C_2H_2Cl_2$	3.97	1.260	2.520	5.04	6.3	12.6	25.2	37.8	50.4	63.0	75.6	2 to 2.5	5.04 to 6.3	2 hours	5.6 to 11.4	14.1 to 28.7
Ethyl Bromide	C_2H_5Br	3.53	1.415	2.830	5.67	7.09	14.15	28.3	42.5	56.7	70.8	85.0	2 to 2.5	5.67 to 6.08	2 hours	6 to 11	17 to 31.2
Chloroform	$CHCl_3$	3.22	1.555	3.105	6.22	7.77	15.55	31.1	46.6	62.2	77.7	93.2	2 to 2.2	6.22 to 6.84	1 hour	-	-
Dichlorodifluoromethane	CCl_2F_2	3.18	1.575	3.145	6.30	7.85	15.7	31.4	47.2	62.8	78.5	94.2	28.5 to 30.4	89.6 to 95.7	2 hours	-	-
Monofluorotrichloromethane	CCl_3F	2.80	1.785	3.57	7.15	8.93	17.85	35.7	53.6	71.4	89.3	107.0	10	35.7	2 hours	-	-
Carbontetrachloride	CCl_4	2.50	2.0	4.0	8.0	10.0	20.0	40.0	60.0	80.0	100.0	120.0	2 to 2.5	8 to 9.2	1 hour	-	-
Dichlorotetrafluoromethane	$C_2Cl_2F_4$	2.25	2.22	4.45	8.89	11.12	22.2	44.5	66.7	89.0	111.2	133.5	20.1 to 21.5	89.6 to 95.7	2 hours	-	-
Gasoline	C_5H_{12} to C_9H_{20}	4.43 to 3.32	1.13 to 1.51	2.26 to 3.01	4.52 to 6.02	5.65 to 7.53	11.3 to 15.05	22.6 to 30.1	33.9 to 45.2	45.2 to 60.2	56.5 to 75.3	67.8 to 90.4	-	-	-	1.4 to 6.0	3.16 to 18.2

Darkened portions of the above toxicity chart show the lbs. per cu. ft. of various refrigerants which seriously injure or are fatal to guinea pigs (based on recent report Underwriters' laboratory).

Thompson Describes Freon Refrigerant

(*Continued from Page 8, Column 5*)

would produce a health hazard are:

1. There must be a Freon leak in the system.
2. There must be a leak of large quantities of Freon.
3. There must be a very rapid leak of large quantities of Freon.
4. The Freon must leak into a confined, non-ventilated or hermetically sealed space.
6. There must be an open flame in the confined space.
6. There must not be stew pans containing water on the gas flame which would absorb acids.
7. There must be a fan for circulating the heavy Freon vapor (4.2 times heavier than air) from the floor into the gas flame.
8. There must be sufficient time allowed to permit all of the Freon in the confined space to pass through the flame to be decomposed and become irritating.
9. There must be a person in the confined space who could not recognize the presence of the decomposition products.

There is not even a remote possibility that these nine conditions could occur simultaneously, other than under laboratory test conditions.

I wish to quote from the Underwriters' Laboratories report M. H. 2375, which reads:

> "The conditions maintained in the test were severe. Neither the test conditions nor the concentrations used can be asserted to be those which will exist in any given enclosure, since the size of such enclosure, the ventilation, and vere than are encountered in practors. The data contained in this investigation, however, are comparable and serve as a practical measure of the comparative hazards of refrigerants under working conditions."
>
> "It will be noted that in order to obtain an accurate basis for comparison the tests were conducted under conditions more severe than are encountered in practice. The test room is smaller than the average sized kitchen and no ventilation whatever is provided. Hence, effects shown by the tests are more severe than the effects obtainable under conditions to be anticipated in practice."

The best evidence of the safety of Freon in actual service is that approximately 3,000,000 lbs. of Freon have been used in refrigeration equipment, a large portion of which was placed in household units. The household units, which leaked—such as you and I know—were installed in kitchens adjoining gas-fired ranges, but there has never been a record of complaint from any user relative to decomposition products.

Piston Displacement

Regardless of the fact that Freon has a low B.t.u. refrigerating effect per pound (less than one-ninth that of ammonia, which has the highest B.t.u. refrigerating effect), the piston displacement of a Freon compressor is only 69 per cent greater. The B.t.u. effect of Freon is approximately one-third that of methylene chloride, sulphur dioxide or methyl chloride, or one-fourth that of methyl formate, although the Freon compressor has a displacement of 92 per cent, 36.5 per cent or 89 per cent less respectively.

The volume per pound of the refrigerant vapor, together with the B.t.u. refrigerating effect, determines the piston displacement, and since Freon has a very low volume per pound of vapor, the comparatively low heat value is compensated. The piston displacement of 5.815 cu. ft. per minute per standard ton is only one of many factors in determining the design of refrigeration apparatus.

It is possible to use present equipment in many cases provided proper cognizance is given to the new B.t.u. capacity, piston displacement, pressure control mechanism, regulating valve orifice size, lubrication, and gas velocity.

A curve was recently prepared which plots cubic feet piston displacement against boiling point of refrigerant. Strangely enough, these points produce a very uniform curve which may be used for predicting displacements when boiling point is known.

Quantity of Refrigerant

A refrigerant must not be judged only by the fact that it has a high or low refrigerating effect per pound, but also the volume per pound of the liquid refrigerant must also be taken into account.

While Freon has a relatively low refrigerating effect, this is not a disadvantage as it merely indicates that greater volumes of liquid must be circulated to produce the desired amount of refrigeration.

Actually, it is an advantage to circulate large quantities or at greater speed as the greater volume or speed will permit the use of less sensitive, more accurate and more positive operating and regulating mechanisms with less critical adjustment.

Head Pressures

Operating head pressures will vary with the temperature of the condensing medium, whether an air or water-cooled condenser is used, and with the operating back pressure. Within the wide range of Freon application this operating head pressure in pounds per square inch gage may be closely approximated by multiplying the temperature of condensing medium in degrees Fahrenheit by a head pressure factor of 1¼ to 2, depending upon the three conditions just mentioned.

For example, let us assume an air-cooled household unit in a 70° F. kitchen, operating with a 20 lb. back pressure (average 18° F. evaporator). This factor will be 1.77. 70 times 1.77 equals 124, so that the operating head pressure will be 120 to 125 lbs. gage.

Freon may be used in either air-cooled or water-cooled compressors, due to relatively low horsepower and exceedingly low compression temperatures. The low temperature of adiabatic compression of Freon is 109.5° F. (standard ton conditions), thus requiring less condensing surface for the removal of superheat than is needed for other refrigerants now in common use.

Back Pressures

Freon-charged compressors operate at low but positive back pressures down to approximately minus 20° F., which permit of high volumetric efficiency. Positive pressure prevents moisture-laden air from accidentally entering the system, which would reduce the coefficient of performance by the air lodging in the condenser and cause high head pressures and temperatures and also cause the moisture to freeze out as ice and interfere with the normal operation of the liquid regulating valve.

Positive pressures permit of testing and locating a leak as it is difficult to locate a leak when the apparatus is operating at negative pressure. It is believed that outward leaks of a refrigerant are better than inward leaks of air, assuming of course that the refrigerant is non-toxic, non-irritating, non-flammable, non-explosive, non-injurious to foods, or is one which will not cause a health, fire, panic or property damage hazard.

Gravity

Since the specific gravity of Freon liquid is from 1½ to 2½ times greater than that of other commonly used refrigerants, with the exception of sulphur dioxide, the float valve ball must be designed of the proper weight and buoyancy to control the flow of refrigerant positively through the regulating valve.

Density

Saturated Freon vapor at 5° F. is much more dense than other compressor gases used as refrigerants, with the exception of carbon dioxide, with the result that the Freon gas velocity must be reduced so as to avoid excessive pressure drops.

All restrictions to the free passage of Freon vapor should be eliminated or reduced in order to obtain maximum operating efficiency. This will undoubtedly call for the redesigning of intake, discharge, and service valves to provide increased opening. A close study should be given to pressure volume diagrams.

Density, viscosity, thermal conductivity, Reynold's number, etc., should be the foundation of good engineering design, but in addition such factors as solvent action of the refrigerant on the oil, greases, binder, oxides, surface wetting characteristics, methods of manifolding, and many others must be taken into account.

(*Concluded on Page 10, Column 1*)

6½ MILLION PROSPECTS

for Automatic Refrigerators are being "sold" Flexible Rubber trays and grids

Millions of refrigerator owners already have Flexible Rubber Trays and Grids • Many more millions have seen them in the homes of friends and want them also • And—in 1934—Inland's advertising will "sell" more than 6½ million refrigerator prospects on the fact that no mechanical refrigerator is truly up-to-date unless it has the modern convenience of Flexible Rubber Trays or Grids • The Inland Manufacturing Co., Dayton, Ohio.

INSIST

that every model of the refrigerator you sell comes equipped with Flexible Rubber Trays or Grids—and sell these modern ice-cube conveniences to the owners of refrigerators in your territory.

Flexible Rubber Trays & Grids

ICE CUBES INSTANTLY — TRAY TO GLASS

Operating Data on F-12 Refrigerant

(*Concluded from Page 9, Column 5*)

Lubrication

The lubrication of a Freon-charged compressor is similar to that of a compressor using hydrocarbon refrigerant such as methyl chloride, ethyl chloride, isobutane, or methylene chloride, which are completely miscible with mineral lubricating oil.

The lubricant used with Freon-charged compressors should be a straight run and properly refined mineral oil and obviously must not contain water, sediment, acid, soap, resin, or any substance not derived from petroleum, and must not form wax or gum in the presence of Freon. All of the oil refining companies are now in position to supply mineral lubricating oil of the proper characteristics and quality.

Freon absorbs small quantities of mineral oil, depending upon the oil characteristics, temperature of the oil in the crankcase, and operating back pressures, but unlike refrigerants other than the hydrocarbon refrigerants, does not deposit the lubricating oil in the low side of the system.

The use of glycerin or ethylene glycol is not recommended as those compounds are highly hygroscopic and, in addition, have a tendency to become gummy or produce a sticky smudge on surfaces when the compressor or system is idle or when the lubricant is heated. It is my belief that miscibility with positive oil return and foaming of oil is to be preferred to immiscibility with oil logging.

Horsepower

The horsepower per standard ton of refrigeration is substantially the same for all refrigerants with the exception of carbon dioxide. Mother nature provided that we cannot get something for nothing, and to obtain a certain amount of work there must be expended a very definite amount of energy. It is interesting to note that the theoretical horse power of Freon is .959, sulphur-dioxide .960, methyl chloride .970, and ammonia .979.

Filtration

Freon, being an excellent solvent, has the ability of dissolving, loosening, and physically removing all factory dirt, oxides, scale, soldering flux, factory washing compounds, etc., that may be in a system, and causing the foreign matter to be removed by the liquid or vapor Freon, and the heavy particles or corrosion products to be deposited at the strainer or filter and close the system. Filters of fine mesh screen of sufficient area to provide blocking in a short time should be provided and so designed as to be readily disassembled to permit cleaning.

Detecting Leaks

A Freon leak may be detected by means of a halide lamp, which may be described as a torch burning alcohol which, under normal conditions, produces a colorless flame. A tube fastened to the base of the burner is used to conduct the air suspected of containing Freon vapor through the flame and over metallic copper. Owing to the breaking down of the refrigerant in the flame, a volatile copper halide is formed and the flame color changes from the normal colorless one to a bright green if the air contains as much as .01 per cent of Freon. Such a leak is equivalent to the escaping of Freon at the rate of 1 oz. of liquid per month, or ¾ lb. per year.

Freon is not as difficult to hold as other compressed gases used as refrigerants when under the same pressure. The leak of a gas or vapor from a system is inversely proportional to the square root of its molecular weight. Freon has a molecular weight of 120.9 as compared with 64.07 for sulphur dioxide, 50.48 for methyl chloride, 17.03 for ammonia, and 29.0 for air. It is my belief that a leak of a refrigerant is related to odor and price and not to the ability to hold the material.

In *Railway Age* of Feb. 24, on page 290, appeared an article on the cost of maintaining air-conditioning equipment on 200 railway cars that have traveled an aggregate distance of some 23,000,000 car miles. An extract follows:

> "A check of the 1932-1933 season showed that loss of refrigerant from all causes, such as valve stem leakage, system purging, etc., has averaged not more than 1½ lbs. per car per month."

The type of service to which this refrigerating equipment has been subjected is much more severe than any set of conditions that would ever exist in stationary installations.

Drying Units

Moisture must be removed from Freon systems to prevent formation of ice crystals at the regulating valve, prevent oxidation, and prevent intercrystalline embrittlement of brasses when under cyclic stress. This moisture may be removed by heating and evacuating units (household size), as has been the practice throughout the industry for years, or by the proper use of a drying agent such as silica gel, activated alumina, calcium chloride, or calcium oxide.

When oven equipment is not available, we recommend that activated silica gel or activated alumina dryers be used in the liquid line as they have good absorption capacity and no new compounds will be formed when an amount of water in excess of the absorption capacity is present.

We do not recommend the use of calcium chloride, as the cartridges invariably are too small in absorption capacity and a brine is formed which will play havoc with the entire system. When excessive moisture is present, calcium oxide hydrates to calcium hydroxide and finely divided material is removed from the cartridge by the velocity of the Freon liquid and is deposited throughout the system.

Moisture absorption is influenced by temperature, moisture, rate of flow, size of activated absorbent capacity for absorbing moisture, and size of equipment. The miscibility of water in Freon is low, being in the order of .006 per cent by weight at 32° F. and .015 per cent at 77° F.

Insulating Tape

Freon is being used in totally enclosed compressors where the motors operate in an atomosphere of refrigerant and oil, as ordinary insulating fabrics are unaffected and suitable impregnating materials have been made commercially available.

When all moisture has been removed from hermetically sealed units it is not necessary to use treated tape, treated insulation, or impregnating varnishes.

The electrical resistance (ohms) of dry Freon in from 100 million to infinity.

Handling Freon

It is not necessary to use a gas mask when handling Freon, since it is non-toxic, but large lensed spectacles should be worn to prevent liquid Freon from freezing the moisture in the eyes.

Should liquid Freon come in contact with the eyes, the person suffering the injury should be taken at once to a good eye specialist (avoid rubbing) and be given the following first-aid treatment. Irrigate the eye with sterile oil, and after irrigation continue washing with either a weak boric acid or sterile salt solution not to exceed 2 per cent sodium chloride.

Summary

Freon has a boiling point of —21.7° F.; is a colorless, almost odorless, non-irritating, non-toxic, non-flammable, non-explosive, non-corrosive, refrigerant with proper chemical, physical and thermodynamic properties for use in reciprocating type compressors.

Freon - charged compressors are small in size, light in weight, operate at low but positive pressures, and use commercially available mineral oil for lubrication. Furthermore, the manufacturer has a wide selection of materials and metals for efficient design.

Freon is sold to the following builders of refrigerating equipment:

Frigidaire Corp.
Baldwin-Southwark Corp.
General Electric Co.
General Refrigeration Corp.
Pennsylvania Engineering Corp.
Baker Ice Machine Co.
Frick Co., Inc.
Vilter Mfg. Co.
Kelvinator Corp.
Universal Cooler Corp.
Carbondale Machine Co.
Reliance Refrigerating Mfg. Co.
Pullman Car & Mfg. Co.
Carrier Corp.
York Ice Machinery Corp.
Westinghouse Electric & Mfg. Co.
Cooling & Air Conditioning Corp.
Dersch, Gesswein & Neuert, Inc.
Liquid Cooler Corp.
Worthington Pump & Machinery Corp.

and to their authorized distributors and dealers.

The U. S. Navy Department permits the use of only Freon and carbon dioxide, due entirely to the safety features, on board fighting craft as covered by their specifications S-59-1 and S-59-2.

Freon-charged units are now being used or installed on 929 cars and 26 railroads and is used exclusively on the new modern, high speed, streamline aluminum or stainless steel trains now in service or soon ready for initial runs.

Keilholtz Sees Need for Small, Low-Cost Summer & Winter Air Conditioners

By L. S. Keilholtz, Research Engineer

BEFORE the ultimate goal of popular, widespread use of air conditioning in residences is attained, it would appear that manufacturers must bring out simple, inexpensive air conditioners that can be built in large quantities at a low production cost.

The large middle class of our population is not yet prepared to spend several hundred dollars for equipment which they have done without for many years, and which they can delay buying until the price comes down.

The comparatively new and much-talked about business of air conditioning can be divided into two entirely different operations: summer air conditioning and winter air conditioning.

Summer air conditioning has great popular appeal because of the relief it brings from the discomfort of hot and humid summer weather.

Winter air conditioning is even more vital to human health and efficiency than summer air conditioning, although it is less spectacular. It offers increased cleanliness and preservation of physical property in our homes and offices, in addition to the many physiological benefits cited by our medical profession.

The maintenance of proper relative humidities and purity of air in combination with properly controlled temperatures act as a major preventative to ailments common to winter.

Some of our latest types of heating systems are built to distribute great quantities of heat into our living quarters in an attempt to make us more comfortable. In my opinion we do not need more heat, but rather less heat. It is too much of a shock to the human system to step out of a hot room with low relative humidity into the cold winter air of high relative humidity. The answer to that is the proper control of indoor humidity in the winter time.

No matter how well Madam Housewife keeps her home, there are always two general types of dirt temporarily suspended in the air. These can both be removed by air conditioning.

A large-surface filtered screen will take out the black, greasy, sticky dirt which is otherwise deposited on the walls, woodwork, and draperies.

A finely atomized spray and scrubber plates will remove the heavy gray dirt and soluble dirt which tends to get into rugs and to dull the polish of furniture.

Proper humidification requires the evaporation of many gallons of water daily. Small homes may need only 5 gallons evaporated per day, others from 10 to 15 gallons, and a large home will probably require 20 gallons of humidification per day to secure proper humidity conditions. Obviously, a small portable humidifier or a few pans atop the radiators will not be sufficient.

Eventually, even the "fresh air fiend" will come to realize that conditioned inside air is much cleaner and better for him to breathe than ordinary outside air.

Contrary to some old-fashioned ideas, the amount of carbon dioxide in normally occupied inside space is harmless, and there is very little danger of devitalized or oxygen-deficient air.

When the air is conditioned in an ordinary home, tobacco smoke and odor will not be objectionable due to air diffusion and the continuous infiltration of outside air. Ventilation is necessary, however, in a private office where there is considerable smoking.

If you were to count all air-conditioning installations in this country you would not reach a six-figure number. Last year all companies making worth-while equipment sold about 5,000 units, estimates show.

Why is it then, that air conditioning has not made more progress in the last few years? Business leaders all over the country believe that nothing on the business horizon holds forth the promise that air conditioning does, and they are convinced that sales volume will approach hundreds of millions of dollars annually, with attractive profits to those industries supplying equipment.

If a hundred company executives were questioned, their answers would bring out certain facts:

First, they are not sure what air conditioning is all about, and how to enter the field intelligently. From what has been submitted to them, some equipment looks hopelessly inadequate while other seems to be too complicated and expensive except for commercial installations.

Development of equipment for commercial applications would require the expenditure over a period of years of several hundred thousand dollars and an extensive outlay of tools to build equipment for a market that is already being served satisfactorily by large air-conditioning manufacturers now entrenched in the field.

But for the large middle class market of homes and single offices there are two simple, useful pieces of equipment, in my opinion, which a company can bring out and produce in large quantities at a low price.

One is a portable, localized summer air conditioner complete to sell for $125 to $150. It isn't necessary to cool an entire room or office. I believe it is practical to direct a limited amount of cleaned, cooled, and dehumidified air onto one or two people, recirculating the conditioned air so that a minimum of refrigeration is needed.

The other is a small winter air conditioner with a sales price from $75 to $100 which could be installed to augment present heating systems and produce the healthful benefits of complete winter air conditioning throughout the six or eight months of the heating season.

To do a little figuring, there are 365 days in the year and 24 hours to the day. Multiplying them together, we find there are 8,760 hours in a year. Likewise, six weeks are 1,000 hours.

Various authorities state the need for cooling and dehumidification in the northern part of the United States at from 250 to 500 hours, and in the southern part from 500 to 1,000 hours. Heating is required from six to eight months of the year, except in the South.

If room coolers are placed in the home to cool, dehumidify, and purify (to a limited degree) the air in the large living room, why not make them year 'round air conditioners by providing adequate humidifying and circulating features?

This need not cost a great deal extra, and will give the manufacturer a decided advantage of merchandising a product with sales appeal throughout the year.

It will not be many years until the better class of homes, offices, apartments, and small business establishments will be completely air conditioned. What is most needed right now is cooling equipment that can be installed in a home for less than a thousand dollars, that will run quietly, and operate inexpensively.

Walter Fleisher, one of the pioneers in air conditioning, says there are six methods of obtaining the essential cooling for domestic air conditioning:

First, by evaporation of water. This he considers hardly reliable for humid days.

Second, by ordinary compression or absorption refrigeration systems. Toxic refrigerants, he does not consider suitable.

Third, by the use of surface or well water. This, he points out, is seldom obtainable in sufficient quantity (or at sufficiently low temperatures).

Fourth, by the adsorption system of cooling. This system employs Silica Gel, alumina, or calcium chloride, and extracts moisture from the air for dehumidification, but raises the dry-bulb temperature. The dry-bulb temperature is then reduced by well water or some form of refrigeration.

Fifth, by utilizing the melting effect of ice. This has the disadvantages that the equipment is bulky, the ice is expensive, and must be handled and stored in large quantities.

Sixth, by the use of the steam ejector system. He believes this method has considerable possibilities.

Further investigation of the steam ejector system reveals the fact that it is uneconomical to use unless there is a cheap supply of steam and plenty of low-priced water available.

Some large company may work out a practical absorption refrigeration system for air conditioning. Available data would indicate that its operating cost should be low.

In analyzing the various methods of obtaining summer cooling, it appears that the compression system is the best at the present time, but a cheap source of power must be used. Electric power even at low rates is quite expensive, and in addition necessitates a separate power line to the building due to the high current demand.

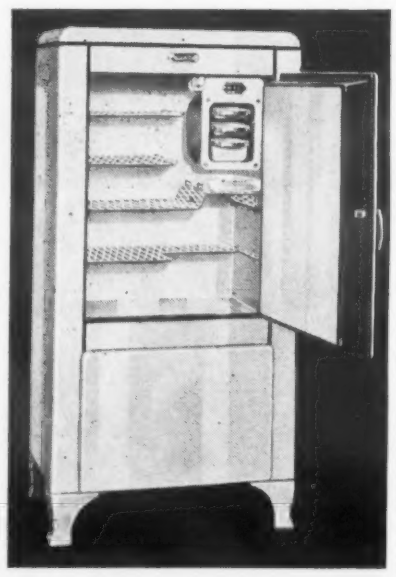
One solution to this problem may be the use of an engine-driven compressor of about five tons of refrigeration capacity. Such an outfit would have an operating cost ranging as low as from 6 to 10 cents per hour using natural gas or fuel oil.

Incidentally, if city tap water is used to cool the refrigerant condenser, the cost will be fairly high, and when large numbers of air-conditioning installations are placed in a city they may overtax the water supply. Best answer to this problem appears to be evaporative cooling of the condenser.

Manufacturers who want to diversify or produce a more profitable line of equipment may well consider air conditioning. It is possible to select products for the air-conditioning field that are not unduly competitive.

This will require an analysis of available production facilities to determine what can best be manufactured, then an appropriation of several thousand dollars for a development program by engineers versed in air conditioning, and a study of available books and magazines on the subject, followed by a merchandising program headed by a sales executive who devotes his entire time to the air-conditioning market.

Prosper with Copeland



Distributors all over the Nation are writing, phoning and wiring about the 1934 line of Copeland Domestic Refrigerators.

Requests for territory, accompanied by generous orders for all Household models are reaching us by every mail.

We are not surprised. Every Copeland model is designed to meet public approval, is attractive in appearance, efficient in performance and is *priced to sell.*

Copeland is committed to a policy of supplying the ultimate in value; without sacrifice in any essential feature; and definite co-operation with the distributor.

Hundreds of thousands of Copeland Domestic Refrigerators all over the world have made a name for efficient performance and the good will built up for Copeland simplifies selling.

Distributors enjoy exclusive territorial rights, generous discounts and popular prices.

In addition to the Household line, Copeland manufactures 21 distinct sizes of Commercial Condensing Units, in capacities from 100 lbs. to 3250 lbs. I.M.E. per 24 hours.

Write, wire or phone if you are interested in making money in the Refrigeration business in 1934.

COPELAND REFRIGERATION CORP., Mt. Clemens, Mich.

Copeland

DEPENDABLE ELECTRIC REFRIGERATION

Sales Up! Salesman Wanted!

The rapid expansion of our Commercial Department has created an opening for a salesman with outstanding sales ability and commercial refrigeration experience. The growing demand for General Electric Commercial Refrigeration equipment plus our special compensation plan assures an adequate income with a chance for practically unlimited earnings to the man we hire. He must be of good appearance, forceful personality but above all, ambitious and unafraid of hard work. If you are looking for an opportunity to associate yourself with a top notch sales organization whose commercial business is increasing monthly, call for an interview.

Rex Cole, Inc.

21st St. & 4th Ave., 2nd floor. New York, N.Y.

Ask for Mr. L. H. Jenks, Jr. or Mr. J. F. Vernon, Jr.

ENGINEERING

Newest Monitor Top Has Refined System, Improved Condenser

(*Concluded from Page 1, Column 5*)

chromium plated, so that the front of the cabinet, when the door is closed, presents a snow-white appearance characteristic of medical clinic cabinets. A pressed steel strip, finished in black, covers the four-inch cabinet legs and forms a base in keeping with the modernistic design of the cabinet. This strip is removable for cleaning purposes.

The "Monitor Top" on the new deluxe models of that series has been greatly refined in appearance, the walls being made smooth, with a wide circular flat band in the center of the steel sheath. The circular metal temperature control panel has been moved from the top front of the cabinet to the center of this flat band, adding to the improved appearance of the Monitor Top.

In addition, the float valve has been moved back out of sight, being located between the case and condenser, thus providing additional flat space on top of the cabinet. The starting relay also has been removed from the cabinet top and placed back of the condenser.

An improved control feature of the new "Monitor Top" models is the automatic reset by which the unit is automatically returned to normal operation when the wide-cycle defrosting period is finished. Refrigeration is never interrupted during defrosting, and defrosting is completed automatically.

Both the T-7, which is finished with porcelain exterior, and the X-7, which has baked glyptal exterior, have 12.3 sq. ft. of shelf area.

Features of the deluxe "Monitor Top" models include an improved foot-pedal door opener, improved door latch, wiring molded in sockets, flat wire shelves (which are sliding and adjustable in height), and an automatic interior electric light with guard for lamp. The stainless-steel, open-front evaporator is standard on these models.

Standard accessories on the T-7 include vegetable pan, wire fruit basket, glass chiller tray, ice tray remover with handle, and a set of covered glass food containers. The X-7's accessories include vegetable pan, glass chiller tray, and ice tray remover.

Model F-5, as the flat top is known, has 10.9 sq. ft. of shelf area. Features include foot-pedal door opener, automatic interior lighting, and a centered evaporator.

Engineering Details

Condensing unit (CD type) in the new flat-top model is of the conventional type, with a single-vane rotary compressor using 2¼ lbs. of sulphur dioxide refrigerant. It is belt-driven by a ⅛-hp. G-E capacitor motor. Wiring and tubing from the condensing unit below to the cooling unit above are encased in rubber.

The condensing unit is spring-mounted in the bottom of the cabinet with a finned coil condenser toward the front. Cool air from near the floor is drawn through the condenser by a four-blade fan on the motor shaft, forced across the compressor and exhausted through the rear of the cabinet in such a manner that exhausted warm air is not permitted to recirculated in the condensing unit compartment.

The compressor consists of a cylinder (concentric with the horizontal shaft), in which a cylindrical rotor (mounted on an eccentric) revolves. A single, stationary blade held against the rotor by a spring, rides on the rotor and separates the suction and discharge ports in the cylinder wall. Shaft seal is of the bellows type.

Compressed refrigerant passes from the discharge port through an acoustic filter into the top of the compressor case. From here it is carried through a discharge service valve on the compressor to the condenser where it liquefies and collects in the high-side float chamber. This float valve is mounted on the compressor base.

From the float valve, liquid refrigerant is automatically fed up to a throttling valve, just before the evaporator, which serves to prevent frosting of the liquid line between the float and the evaporator.

Liquid refrigerant enters the evaporator through injectors, one on each side of the evaporator, producing forced circulation of the liquid refrigerant and resulting in a rapid rate of cooling.

The evaporator is fabricated of stainless steel, and has a refrigerated freezing shelf. It is of welded construction, with rounded corners for ease of cleaning. It is maintained in a flooded condition at all times by regulation of refrigerant by the high-side float.

Service Valves

Service valves are provided at both suction and discharge lines at the compressor, the suction valve being of the disk type to serve as a check valve to prevent refrigerant from entering the compressor when the unit is not running. Service valves are removable, making it possible to replace the compressor in the field.

The compressor is permanently oiled by a supply of lubricant contained within the compressor casing. Oil is maintained up to about three-quarters the height of the compressor. Each bearing surface is supplied with oil under a forced-feed oiling system.

Mounted atop the motor is a cylindrical capacitor. The motor is held in oil-impervious live rubber mountings clamped to a pivoted cradle acting as an automatic belt tightener which depends on the motor load, not on springs, for its action.

Temperature control is mounted on the evaporator and includes an on-and-off switch, a thermostat to dictate operation of the compressor, an overload protective device, and a semi-automatic wide-cycle defrosting switch which, unlike the Monitor Top models, must be returned to normal operation manually.

Monitor Top System

The new Monitor Top mechanism has the same sealed-in-steel features that have featured this line of G-E refrigerators since their inception, but in addition has certain refinements and employs G-E's new low-pressure refrigerant methyl formate (boiling point 88° F. at atmospheric pressure).

As shown in the front-page picture in this issue, the new Monitor Top has a smooth unbroken condenser surface, float valve has been moved behind the condenser, and the control is mounted in the front of the condenser. Condensation is accomplished by natural circulation of air over the exterior of the condenser.

The use of a condenser of such surface has been made possible, G-E engineers state, by adopting the low-pressure refrigerant and by new developments in the control of automatic electric line welding equipment used in manufacture of the condenser.

Condenser Is Welded

The condenser consists of two corrugated steel sheets electrically line welded together to form tube-like passages through which the compressed refrigerant flows. It is supported by vertical fins between the condenser and the compressor housing. Both condenser and compressor are finished in glyptal-baked enamel.

The movable element of the compressor, the oscillator, is actuated by an eccentric on the vertical shaft. It oscillates rather than rotates, being keyed to the cylinder by a sliding blade. The motor is supported above on the same shaft. The compressor is spring-mounted within the steel case, and is balanced to prevent transmission of vibration to the exterior. Oil under pressure is forced to each moving part.

Serving to equalize the pressure on the compressor when the motor stops (reducing the starting load on the motor) is an automatic unloader. This consists of a plunger which opens and closes a by-pass between the compression and suction sides of the compressor. When the motor slows down to stop, the plunger opens the by-pass; when the motor starts and comes up to speed again, the plunger moves by centrifugal force to close the by-pass.

Operating similarly is a check valve which opens and closes the suction line as the motor starts and stops, eliminating the possibility of compressed refrigerant vapor entering the cooling unit when the compressor is not running.

Evaporator with this Monitor Top is located on the under side of the cabinet as an integral part of the refrigerating unit. It is constructed of a corrugated and a flat sheet of stainless steel, electrically line welded together forimng two cylindrical headers at the top, and vertical tubes along the sides through which the refrigerant circulates.

This cooling unit also employs forced circulation of the refrigerant, and is of the flooded type being fed from the high side float atop the cabinet, behind the condensing unit.

Wellington Is Production Manager for Rempe

CHICAGO—E. P. Wellington, formerly associated with Servel, Inc., has joined the Rempe Fin Coil Co. here as manager of production, according to G. A. Rempe.

ONLY

DELCO MOTORS

have this

VULCANIZED RUBBER CRADLE MOUNTING

Most motors are quiet when they leave the factory . . . but how about the *second* and *third* year of operation? The normal quietness of Delco motors, due to proper balance and precision manufacture, is well known; and now, with the special vulcanized rubber cradle mounting, this quietness becomes even more appreciated. The rubber is vulcanized both to the motor ring and to the supports, allowing full rotative flexibility, yet curbing any tendency of the shaft to twist out of line. So successfully does this new Delco mounting isolate vibration and hum from the base that the quietness of Delco motors is rapidly becoming a by-word in the electrical manufacturing industry. It is a simple matter to engineer a Delco motor into a good product . . . and the result is highly gratifying to manufacturer, dealer and ultimate owner. Delco engineers are always at your service.

NRA MEMBER U.S. WE DO OUR PART

DELCO PRODUCTS CORPORATION, DAYTON, OHIO

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VOL. 11, NO. 12, SERIAL NO. 261, MARCH 21, 1934

The Potential for 1934

INTELLIGENT and reasonably accurate prognostications as to the future prospects for an industry are not always easy to make, even when the cards seem to be stacked so favorably as they appear to be for electric refrigeration. Hence one who would risk making a forecast for the current year in refrigeration is somewhat in the same position as the father who was confronted by an indignant offspring thusly:

"Dad, do you remember my asking you last night how much a million dollars was?"

"Yes; what of it?"

"Well, 'a hell of a lot of money' wasn't the right answer."

It is, however, just about the best answer one can venture right now to the person who asks: "How many refrigerators will the industry sell *this* year?"

Perhaps it will be another million, maybe even a million and a half, but most assuredly "a hell of a lot" of refrigerators will be sold.

At R. Cooper Jr.'s seventh anniversary banquet in Chicago last week, Vice President T. K. Quinn of the General Electric Co. declared that it wouldn't surprise him if 1,500,000 electric refrigerators were sold in 1934, and 2,000,000 in 1935! Orders now on hand for General Electric appliances, he stated, showed a 100 per cent gain over orders on hand at this time last year.

Out at the big Chicago plant of the Stewart-Warner Corp. there is another highly confident man. He is Charles D'Olive, manager of the Stewart-Warner refrigeration division, and he is predicting that the industry will sell at least 1,250,000 units this year. In his first season as general of the Stewart-Warner sales army, he has already procured orders for more refrigerators than Stewart-Warner has built in all its previous history!

In dealer meetings held in the East during the last six weeks, John Knapp, vice president in charge of sales for Norge Corp., has been making public the prediction that 1,600,000 electric refrigerators would be sold in 1934. This prediction is no idle guess; it is based upon buying-intention figures revealed by Norge's now-famous survey of the nation's refrigeration prospects last fall.

H. W. Newell, vice president in charge of sales for Frigidaire Corp., is sincere and earnest in his belief that 1934 will be a record year for Frigidaire—and any old-timer in the industry can tell you that Frigidaire has had some whopping big years!

Under the direction of Vice President A. E. Allen, the Mansfield plant of the Westinghouse Electric & Mfg. Co. is being driven at increased speed to turn out the 150,000 units (almost twice the 1933 production) which Ray Cosgrove, manager of the refrigeration division, thinks Westinghouse should sell this year.

Powel Crosley, Jr., has set up a schedule of 100,000 refrigerators for his Cincinnati plant this year—which is twice his 1933 production and six times as many refrigerators as he made and sold in 1932! And if orders keep coming in for Shelvadors at the present rate, that 100,000 quota may be far oversold.

Grunow refrigerators, now made under the aegis of the General Household Utilities Corp. in the company's own plants in Chicago (the cabinet making was farmed out to Briggs in Detroit last year), are being sold in 1934 by an augmented distributor organization, and by approximately one and one-half times as many dealers as had the Grunow franchise during the 1933 selling season—all of which leads H. C. Bonfig, vice president in charge of sales, to believe that his sales figures should show a material sales increase in 1934. Bill Grunow himself is figuring on a production of 100,000 units.

President George Mason being in Europe, Vice President Henry Burritt on the road, and newly elected Vice President H. G. Perkins unreachable by phone, we have no predictions to offer as coming from Kelvinator. But we've talked with at least five Kelvinator distributors in the last few weeks who insist that their volume for 1934 will be anywhere from 50 per cent to 150 per cent greater than it was last year.

Universal Cooler has trebled its plant capacity in Detroit to take care of orders already on hand, and the schedule is set up for a production of considerably more than three times as many units as were turned out by this establishment last year. Nor would it surprise President G. M. Johnston if his 1934 production turned out to be four times his 1933 figure.

With the biggest manufacturers apparently assured that 1934 will be their biggest year, individually and collectively, and with the smaller of the major manufacturers working on production schedules stepped up to figures two, three, and four times their 1933 sales totals, one begins to understand how right Mr. Quinn and Mr. Knapp may be in their confident assertions that the industry should do one-and-a-half times as much business this year as it did last—its all-time peak year.

WHAT OTHERS SAY

The Electrical Industry Meeting

LIKE the summer thunder shower that clears the atmosphere with much noise and alarming flashes the National Electrical Manufacturers Association sponsored all-electrical manufacturing-industry meeting brought an ultimate satisfaction.

It brought the small manufacturer, whether Nema member or not, the opportunity to have his say, without reservations, before his industry. It led to definite vote upon the revisions prepared for the purpose of making the electrical industry's NRA code workable. Of course the keynote of the meeting was to a large degree legal and defensive. Men bartering away their age-old rights under New Deal legislation must know to what degree they have committed themselves. One does not hazard his all without due precautions.

Over and above the detail discussion and voicing of conservative doubts there stands, however, the definite impression that just as the electrical manufacturing code was among the first to be prepared in a warm spirit of cooperation with NRA, and among the first to be signed by the President, so will its revision be given earnest support. Electrical manufacturers feel that they will benefit from their NRA code. This was clearly reflected in the corridors during the general meeting, when nearly a thousand industry men reviewed and revised the pact.

Under the NRA code electrical manufacturers have found the opportunity to act in unison in the interest of public policy without being handicapped by the chiseling type of competition. In the past costs of distribution were high and competitive practices poorly thought out largely because of the dickering on prices for each order obtained. That situation made impossible a study of distribution, as it involves possible changes of practices, reductions in cost and the maintenance of fair competition. To eliminate the dickering, and that more attention might be devoted to sales and sales promotion, an open price policy was adopted.

What is now sought is the opportunity to establish in principle the right of various manufacturers to offer different but fair prices for a given product to be sold to a given class of trade in a given volume of purchase. Competition in the newer method of selling would thus involve normal but fixed price differentials, quality elements, and service advantages, but without chiseling and without below-cost selling.

Customers do not object to a fair price and a fair profit. They will object to a uniform price and any evidence of collusion in fixing prices. Many problems will be encountered by manufacturers in putting such an open price policy into practice. It will work only if there is an unselfish desire to carry out the spirit of the code as well as patience in developing both the knowledge and the mechanism to make the principle an every-day business practice.—*Electrical World,* March 10, 1934.

LETTERS

How to Obtain Copies of Code

C. Hoffberger Co.
Coal-Ice-Fuel Oil
Monument & Forrest Sts., Baltimore
March 8, 1934.

Editor:

We are interested in obtaining copies of the codes as now in force for the domestic refrigerator manufacturers and commercial refrigerator manufacturers. Please advise where we may obtain these or whether you have copies available that you can send us.

M. M. MILLER,
Refrigeration department.

Answer:

The code for the domestic electric refrigeration industry has not as yet been approved by the NRA, final action being delayed by proposals of amendments to the basic code for the electrical manufacturing industry, to which the domestic electric refrigeration code will be supplemental.

The *proposed* code for the domestic electric refrigeration industry as amended for the open hearings Jan. 29, was published, together with a complete stenographic report of the proceedings at the hearing, in the Feb. 7 issue of ELECTRIC REFRIGERATION NEWS.

There are no more copies of this issue of ELECTRIC REFRIGERATION NEWS available for sale. If you do not have it in your files, you may find it possible to obtain the code from the local headquarters of the NRA or by writing the Publications Division of the NRA, Washington, D. C. The government is charging five cents a copy for the printed codes.

If you attempt to obtain the code from the NRA offices, be sure to ask for the copy of the code *as amended for open hearings Jan. 29.*

The code for the commercial refrigerator industry has been approved by the NRA and was published in full in the Jan. 10 issue of ELECTRIC REFRIGERATION NEWS. This code applies only to manufacturers of commercial cabinets, such as display cases, walk-in coolers, etc.

It is possible that you may be interested in the domestic ice refrigerator code. The code for the household ice refrigerator industry became effective Jan. 9 and copies of the code are available from the NRA.

EDITOR.

Connecticut Claims Topper Jennie Payne

Modern Home Utilities, Inc.
115 Grand St., Waterbury, Conn.
Feb. 7, 1934.

Editor:

You have a great news journal, and one of which you should be particularly proud. The members of our organization thoroughly enjoy the receipt of it every week.

I note in reading your Toppers' notes that Jennie L. Payne is listed as living in New Jersey. It may be merely a slip, but she has been our Topper for the past five years. She was numbered in that small group especially recognized by 'Zim' for having been a Topper for five consecutive years. Besides Mrs. Payne, we also had another Topper in this particular group—Gustave W. Zurcher, of our Hartford branch.

Both of these salesmen have been Toppers since the inception of that organization.

Mrs. Payne is one of the life members of that organization, and I believe (subject to correction, of course) she is the only woman life member.

Keep up your good work.

LELAND L. STACY,
Manager,
Advertising-sales promotion.

A Frigidaire Booster Has a Complaint

1958 Litchfield Ave., Dayton, Ohio
Feb. 7, 1934.

Editor:

I enjoy your paper immensely with one exception—*why not give Frigidaire a break occasionally?* I trust that you realize that thousands of your readers and potential *subscribers* are interested in General Motors and *Frigidaire* especially. Best wishes for a successful refrigeration year in '34.

F. G. PURCELL.

Likes All the News In One Paper

56 Nassau St., Kenmore, N. Y.
Feb. 16, 1934.

Editor:

I wish to compliment you upon getting all the news under one cover. I have been a subscriber since the inception of ELECTRIC REFRIGERATION NEWS and I can tell you that the separation of parts of our dope into two and three papers was not accepted with favor.

In my travels on refrigeration business, I meet all the service and installation men and the salesmen and I have done considerable to extend subscriptions, because ELECTRIC REFRIGERATION NEWS is the best paper published to meet our needs.

HAROLD HUNT.

BOOKS

"THE ELECTRIC HOME"
Author: E. S. Lincoln. Publisher: The Electric Home Publishing Co., New York City. Publication Date: 1933. Pages: 454.

MR. LINCOLN has made the matter of the application of electrical appliances to the home an intriguing, enchanting, and easily understandable subject. This reviewer would venture the guess that if every home owner were to read this book, sales of electrical appliances during the next year would take a big jump.

While "The Electric Home" is written ostensibly for the "layman" who is outside the realm of the electrical industry, it is well worth the time of any person engaged in selling and installing electrical appliances. Not only should he recommend it to his prospects—especially those prospects who are building or contemplating the building of a new home—he should read it himself.

Explains Fundamentals

The value of the book to the dealer in electrical appliances rests in the manner of the author's treatment. Unlike many engineers and technicians, Mr. Lincoln assumes that his reader knows nothing about electricity—he starts off with a primer on electrical terms, defining "volt," "ampere," and "wattage" in ABC terms. This simple descriptive style characterizes Mr. Lincoln's writing throughout the entire book.

Two real advantages are derived from this method of treatment. One is that dealers who are specialists in one appliance, and who are considering or are trying to sell other appliances, will find the information dealing with almost every other kind of electrical appliance very helpful. The other advantage is that dealers and salesmen can improve their sales presentation by borrowing from Mr. Lincoln's simple but effective language.

Kitchen and Refrigerator

The electric kitchen and the electric refrigerator fare very well in this book. The frontispiece (in colors) is of an electric kitchen, and his treatment of the electric refrigerator is praiseworthy, although it might seem that his recommended method of defrosting is a little antiquated.

Other appliances in the all-electric kitchen are described, their advantages set forth, and instructions given for their proper care. In his exposition of these appliances Mr. Lincoln strikes the notes of some fundamental sales arguments that have almost been forgotten.

If there is a weak spot in the book, it is in the treatment of the subject of air conditioning. This does not mean that Mr. Lincoln skips over the subject lightly, but in view of the probable tremendous importance of air conditioning it appears that some of the problems arising in connection with it could have been discussed in more detail. The illustrations in connection with the discussion are, however, rather good, as they are throughout the book.

Convenience Outlets

The author devotes considerable attention to the matter of establishing proper wiring circuits and convenience outlets, and dealers should find this very helpful. His section on the care of electrical appliances, while in no sense a service manual, serves as a reminder of things that should be checked over at definite intervals.

One of the most interesting things in the book from a dealer's standpoint is a table giving the approximate cost of operating almost every kind of electrical appliance conceived. Supplemental to this is a table giving factors for adjustment where the power rate is different from that on which Mr. Lincoln's table is predicated.

Another novel feature of this book is a compilation of suggested electrical gifts for various rooms in the home, which should make excellent sales promotion material for any dealer.

One thing that the author earnestly attempts to do is to tell how to get the best possible use out of each appliance, and the book is worth reading for this fact alone.

If there is an electrical appliance for the home that Mr. Lincoln didn't touch upon—we haven't heard of it. The range of his book covers the application of photoelectric cells, electric worm charmers, multiple house telephone systems, electrically operated machines for the home workshop, cove lighting for kitchens, sewing machines, and bed warmers.

SPECIFICATIONS
OF HOUSEHOLD ELECTRIC REFRIGERATORS

SPECIFICATIONS of 30 makes of self-contained household electric refrigerators are published on this and succeeding pages of this issue of ELECTRIC REFRIGERATION NEWS.

An alphabetical index, by trade names, of makes represented in the specifications tabulation will be found on page 15.

Approximately one hundred questions regarding sizes and dimensions, parts and materials, weights and prices, makes and models are answered by the data presented in these specifications.

Publication of household refrigerator specifications in this issue marks the third consecutive year in which ELECTRIC REFRIGERATION NEWS has offered this service to its readers.

Westinghouse

Westinghouse Electric & Mfg. Co., Refrigeration Department, Mansfield, Ohio

Master Series		BP45	BP55	BP65	BP75			
Model No.	BL43	BL45	BL55	BL65	BL75	AP90	AP130	AP200
Cabinet Specifications								
Overall dimensions (in.)								
Height	57¼	57¼	59⅜	62¼	62½	59¾	60	76
Width	24¼	24¼	27⅜	28⅞	32⅛	39⅛	49½	49½
Depth	15¼	15⅛	15⅛	16	16	16⅛	20	18⅝
Inside dimensions of liner (in.)								
Height	29¾	29¾	31¼	34⅛	34½	32	29¾	50⅛
Width	17⅞	17⅞	20⅝	21¾	25	31¼	43¼	40¼
Depth	15⅛	15⅛	15⅛	16	16	16⅛	20	18⅝
No. of doors	1	1	1	1	1	2	2	4
Storage Capacity								
Gross food storage capacity (cu. ft.)	4.7	4.7	5.7	6.9	8.0	9.3	15.3	21.8
Net food storage capacity (cu. ft.)	4.2	4.2	5.2	6.2	7.5	9.0	13.5	20.1
No. of shelves	3	3	3	3	3	6	5	11
Total shelf area (sq. ft.)	8.9	8.9	10.0	11.6	13.1	15.7	24.8	37.7
Ice Cube Trays								
No. of trays	2	3	3	6	6	3	7	7
No. of cubes produced	44	80	80	118	118	96	192	192
Weight of cubes (lbs.)	4½	8	8	12¼	12¼	11	21	21
Compressor Specifications								
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	¼	¼	¼
Compressor speed, r.p.m.	1740	1740	1740	1740	1740	1725	1725	1725

* * *

Cabinet Materials
Make of cabinet.....Westinghouse
Material used for frame.....Steel
Finish of shelves.....Tinned
Material used for breaker strip....Micarta
Material used for gasket.....Rubber
Insulation material.....Balsam Wool

Finish
Cabinet finish (exterior).....L models—lacquer; P models—porcelain
Cabinet finish (interior).....Porcelain

Evaporator
Make of evaporator.....Westinghouse
Evaporator construction.....Shell
Type of refrigerant control.....High side float
Type of ice trays.....Anodic aluminum

Condenser
Make of condenser.....Westinghouse
Method of cooling.....Forced draft
Type of condenser.....Finned tube

Compressor
Make of compressor.....Westinghouse
Type of system.....Hermetic
Type of compressor.....Reciprocating
Compressor drive.....Direct
Location of compressor.....Above

Refrigerant
Refrigerant used.....Sulphur dioxide

Control
Make of control.....Westinghouse
Type of control.....Temperature
Temperature regulation method....Manual
How defrosted.....Defrosting position on control

Special Features
Interior light on all models but BL43; knee-touch door latch on all but BL43, AP90, AP130, and AP200.

Policy
Guarantee on cabinet.....1 year
Guarantee on system.....1 year
Serviced by.....Distributor or dealer

Leonard

Leonard Refrigerator Co., 14260 Plymouth Road, Detroit, Mich.

Model No.	SL-1	SL-15	SL-2	SL-3	LD-2	LD-3	SP-2	PD-2	PD-3	PD-4	PD-5
Cabinet Specifications											
Overall dimensions (in.)											
Height	51⅛	52⅛	55¼	57⅛	55¼	57⅛	55¼	55¼	57⅛	64¼	64¼
Width	24⅜	27⅞	28½	31¾	28½	31¾	28½	28½	31¾	32¾	40⅜
Depth	24¼	25¾	26	26	26⅜	26⅜	26	26⅜	26⅜	26⅞	26⅞
Inside dimensions of liner (in.)											
Height	24⅛	24⅝	27	28⅛	27	28⅛	27	27	28⅛	35⅛	32½
Width	19¾	22⅛	22⅛	25⅜	22⅛	25⅜	22⅛	22⅛	25⅜	25⅜	32⅝
Depth	17	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18
No. of doors	1	1	1	1	1	1	1	1	1	1	2
Storage Capacity											
Gross food storage (cu. ft.)	4.68	5.89	6.45	7.67	6.45	7.67	6.45	6.45	7.67	9.59	11.7
Net food storage (cu. ft.)	4.35	5.47	6.03	7.21	5.88	7.04	6.03	5.88	70.4	8.96	10.6
No. of shelves	3	3	5	5	6	6	5	6	6	7	5
Total shelf area (sq. ft.)	8.34	10.45	12.62	14.75	13.67	16.14	12.62	13.67	16.14	19.45	21.88
Ice Cube Trays											
No. of trays	2	3	3	4	3	4	3	3	4	4	5
No. of cubes	42	63	63	84	81	108	63	81	108	108	108
Weight of cubes (lbs.)	3.4	5.1	5.1	6.8	8.3	11.0	5.1	8.25	11.0	11.0	16.5
Thickness of Insulation (in.)											
Top	2½	2½	2½	2½	2½	2½	2½	2½	2½	3	3
Sides	2	2½	2½	2½	2½	2½	2½	2½	2½	3	3
Bottom	2½	2½	2½	2½	2½	2½	2½	2½	2½	3	3
Compressor Specifications											
Compressor capacity I.M.E. (lbs.)	113	113	113	128	128	128	113	128	128	163	199
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛	¼	¼
Compressor speed (r.p.m.)	640	640	640	410	410	410	640	410	410	525	640
Compressor bore (in.)	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Compressor stroke (in.)	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½	1½
No. of cylinders	1	1	1	2	2	2	1	2	2	2	2
Amount of refrigerant in system (lbs.)	2.81	3.13	3.13	3.13	3.13	3.44	3.13	3.13	3.44	3.44	3.63
Quantity of lubricant in system (lbs.)	1.25	1.25	1.25	1.63	1.63	1.63	1.25	1.63	1.63	1.63	1.63
Weight, net (lbs.)	316	388	372	403	398	423	380	385	432	503	575

* * *

Cabinet Materials
Make of cabinet.....Leonard
Material used for frame.....Spruce
Finish of shelves.....Tinned
Material for breaker strip....Composition
Material used for gasket.....Rubber
Make of gasket.....Miller
Make of insulation.....Hermetex

Finish
Cabinet finish (exterior).....L models—lacquer; others—porcelain
Cabinet finish (interior).....Porcelain

Hardware
Process of manufacture.....Stamped & forged
Basic metal of hardware.....Brass
Finish of hardware.....Chromium

Compressor
Make of compressor.....Leonard
Type of system.....Conventional
Type of compressor.....Reciprocating
Compressor drive.....“V” belt
Type of shaft seal.....Bellows
Location of compressor.....Below

Motor
Type of motor.....Capacitor

Refrigerant
Refrigerant used.....Sulphur dioxide

Lubrication
How often should motor be oiled.Annually

Control
Make of control.....Ranco
Type of control.....Temperature
Temperature regulation method...Manual & semi-automatic
How defrosted.....Semi-automatically

Evaporator
Make of evaporator.....Leonard
Evaporator construction.....Shell
Metal used.....Steel
Type of refrigerant control.....High side float

Condenser
Make of condenser.....Leonard
Method of cooling.....Fan
Type of condenser.....Finned tube

Policy
Guarantee on cabinet.....1 year
Guarantee on system.....1 year
Serviced by.....Distributor & dealers
Are replacement parts furnished to independent service companies.....No

CABINETS BY

Seeger

SAINT PAUL

DULUX FINISH

THE Seeger Refrigerator Company is pleased to announce that all Residence Cabinets will be built with the New Dulux Finish. A new and distinctly different type of finish, that provides dealers with sales advantages that help him sell more refrigerators, and assures to the housewife the kind of superior beauty and durability long wanted for her Refrigerator.

Dulux is a sparkling white finish of unusual beauty, strength and durability, with exceptional resistance to acids, oil, greases and abrasives. Cabinets by Seeger for the Home are now offered in Dulux Finish, providing the most modernly beautiful Cabinets made—in various models and sizes to fit any requirements, from penthouse, to palace.

Every Cabinet by Seeger has over 30 years of experience built into it, to make it the outstanding Cabinet for Efficiency, Economy, Beauty and Durability.

For detailed information write for Folder on Residence Cabinets by Seeger with Dulux or all Porcelain Finish.

SEEGER REFRIGERATOR COMPANY
SAINT PAUL, MINNESOTA

New York — Los Angeles — Chicago — Boston — Buffalo
Philadelphia — San Francisco

Napier

Metal Saw & Machine Co., Inc. Springfield, Mass.

Model No.	A-4	A-5	A-6	A-8
Cabinet Specifications				
Overall dimensions (in.)				
Height	55½	59	60	60
Width	25	28	30½	35
Depth	20½	22½	22½	24½
Inside dimensions of liner (in.)				
Height	27½	31	32	32
Width	19½	21½	24	28½
Depth	15	16	16	18
No. of doors	1	1	1	1
Storage Capacity				
Gross food storage (cu. ft.)	4.65	6.15	7.15	9.5
Net food storage (cu. ft.)	4	5	6	8
No. of shelves	3	4	4	4
Total shelf area (sq. ft.)	8.13	10.75	12.00	17.00
Ice Cube Trays				
No of trays	2	3	3	4
No. of cubes produced	56	84	84	112
Weight of cubes (lbs.)	3½	5¼	5¼	7
Thickness of Insulation (in.)				
Top	2½	3	3	3
Side	2½	3	3	3
Bottom	3	3	3	3
Compressor Specifications				
Compressor capacity (lbs.) I.M.E.	95	95	95	95
Motor size (hp.)	1/6	1/6	1/6	1/6
Compressor speed r.p.m.	1725	1725	1725	1725
Weight, net (lbs.)	280	310	330	410

Cabinet Materials
Make of cabinet ..... Seeger
Finish of shelves ..... Tinned
Material used for breaker strip ... Panelyte
Material used for gasket ..... Rubber
Make of insulation ..... Balsam Wool

Motor
Make of motor ..... General Electric
Type of motor ..... Capacitor

Finish
Cabinet finish (exterior) ..... Lacquer
Cabinet finish (interior) ..... Porcelain

Hardware
Make of hardware ..... Seeger
Process of manufacture ..... Stamped
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Compressor
Make of compressor .. Metal Saw & Machine
Type of system ..... Conventional
Type of compressor ..... Rotary
Compressor drive ..... Direct
Type of shaft seal ..... Bellows
Location of compressor ..... Below

Lubrication
Brand of compressor lubricant ..... Texaco
Quantity in system ..... 1½ pts.
How often should motor be oiled .... Every 3 months

Refrigerant
Refrigerant used ..... Methyl chloride
Amount in system ..... Model A-4—2 lbs.; A-5 & A-6—2½ lbs.; A-8—3 lbs.

Control
Make of control ..... Ranco
Type of control ..... Temperature
Temperature regulation method ... Manual

Evaporator
Make of evaporator ..... Mullins
Evaporator construction ..... Shell
Metal used ..... Steel, finish in porcelain
Type of refrigerant control .. Low side float
Type of ice cube trays ..... Aluminum

Condenser
Make of condenser ..... Bush
Method of cooling ..... Fan
Type of condenser ..... Finned tube

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... 1 year
Serviced by ..... Dealer
Are replacement parts sold to independent service companies ..... Yes

Testing Service

for Domestic and Commercial Electric Refrigeration

[Testing and experimental laboratory service for Manufacturer, Distributor, Central Station. Test data exclusive property of client.]

Electrical Testing Laboratories
80th St. & East End Ave.
New York

General Electric

General Electric Co., Electric Refrigeration Department, Nela Park, Cleveland, Ohio

Model No.	S-85	S-107	S-146	S-182	HE-7	HE-5	HE-4
Cabinet Specifications							
Overall dimensions (in.)							
Height	67⅞	65⅛	66¾	68¼	57⅛	53⅜	51⅝
Width	34¼	44¾	54¼	64⅞	28¾	26½	24
Depth	26	23½	23	26½	26¾	23¾	23¾
Inside dimensions of liner (in.)							
Height	34⅝	32¼	33⅜	33⅛	30¾	27⅝	25⅞
Width	27⅛	38⅜	47	55¾	23¼	21	18½
Depth	19	17¼	18	18½	19⅞	16¼	16¼
No. of doors	1	2	2	2	1	1	1
Storage Capacity							
Net food storage (cu. ft.)	8.5	10.7	14.6	18.2	7.0	5.0	4.0
No. of shelves	4	8	8	8	4	4	4
Total shelf area (sq. ft.)	16.0	20.0	25.2	30.4	12.0	9.4	7.8
Ice Cube Trays							
No. of trays	4	4	4	4	3	3	2
No. of cubes produced	104	104	104	104	60	60	40
Weight of cubes (lbs.)	12	12	12	12	7½	6¾	4½
Thickness of Insulation (in.)							
Top, sides, & bottom	3	2½	3	4	2½	2½	2½
Door	2⅞	3⅞	2⅞	3⅞	3	2⅞	2⅞
Compressor Specifications							
Capacity, B.t.u. per hour, 100° room, 20° evaporator	650	700	700	1400	700	650	590
Motor size (hp.)	1/6	1/6	1/6*	1/3*	1/8	1/8	1/8
Compressor speed (r.p.m.)	1740	1740	1740	1740	625	575	525
Refrigerant in system (lbs.)	4½	5	5	8	3½	3½	3½
Price, f.o.b. factory	$315	$400	$490	$645	$175	$135	$99.50
Weight, net (lbs.)	496	615	677	997	212	200	160

*Can be provided with either ⅓ or ⅙ hp. machines, depending upon severity of load.

Model No.	P4-180	P170	P134	P110	HT70	HX70	HT47	HX47
Cabinet Specifications								
Overall dimensions (in.)								
Height	81	74½	71⅜	68¾	66¾	66¼	64¾	65
Width	44	61½	48	42	28¾	28¾	24	24
Depth	27¾	24¾	24¼	25	26¼	26¼	24	24
Inside dimensions of liner (in.)								
Height	47¾	35½	35½	33	33¾	33¼	32⅛	32⅛
Width	35¾	53	40¾	35½	22⅞	22⅞	18	18
Depth	20	17	18	19	17	17	15	15
No. of doors	4	3	2	2	1	1	1	1
Storage Capacity								
Net food storage (cu. ft.)	18.0	17.0	13.4	11.0	7.0	7.0	4.7	4.7
No. of shelves	10	12	8	8	4	4	4	4
Total shelf area (sq. ft.)	26.6	26.7	22.1	20.4	12.3	12.3	8.3	8.3
Ice Cube Trays								
No. of trays	4	4	4	4	4	4	2	2
No. of cubes produced	104	104	104	104	84	84	40	40
Weight of cubes (lbs.)	12	12	12	12	9	9	4½	4½
Thickness of Insulation (in.)								
Top, sides, & bottom	3½	3½	3	2½	2½	2½	3	3
Door	3½	3½	3	2½	2⅞	2⅞	4⅛	4⅛
Compressor Specifications								
Capacity, B.t.u. per hour, 100° room, 20° evaporator	1400	1400	700	700	460	460	440	440
Motor size (hp.)	1/3	1/3*	1/6	1/6	1/8	1/8	1/8	1/8
Compressor speed (r.p.m.)	1740	1740	1740	1740	1740	1740	1740	1740
Refrigerant in system (lbs.)	8	5	5	5	3½	3½	2¼	2¼
Price, f.o.b. factory	$655	$590	$440	$375	$260	$230	$170	$155
Weight, net (lbs.)	980	927	686	811	506	500	400	367

*Can be provided with either ⅓ or ⅙ hp. machines, depending upon severity of load.

Cabinet Materials
Make of cabinet ..... General Electric
Material used for frame .... P4-180, P-170, P-134, P-110—spruce; others all steel
Finish of shelves ..... Tinned
Materials used for breaker strip .. Textolite
Material used for gasket .. Moulded rubber
Make of gasket ..... General Electric
Make of insulation ..... Thermocraft

Hardware
Make of hardware ..... General Electric
Process of manufacture ..... Stamped
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Evaporator
Make of evaporator ..... General Electric
Evaporator construction ..... Shell & tube
Metal used ..... HT, HX, & HE line—Stainless steel; others—steel finished in porcelain
Type of refrigerant control ..... High side float
Type of ice cube trays ..... Aluminum & Du-Flex rubber

Compressor
Make of compressor ..... General Electric
Type of system .... HE line—conventional; others—hermetically sealed
Type of compressor .... Models HT, HX, & HE line—rotary; others—reciprocating
Compressor drive ..... HE line—belt; others—direct
Type of shaft seal ..... HE line—bellows; others—none
Location of compressor ..... Above

Lubrication
Brand of compressor lubricant ..... Mineral oil
How often should motor be oiled ..... HE line—annually; others—never

* * *

Motor
Make of motor ..... General Electric
Type of motor .... S & HE lines—capacitor; others—split-phase induction

Finish
Cabinet finish (exterior) .... S line—Sanak; HX & HE lines—Glyptol; others—porcelain

Refrigerant
Refrigerant used ..... HT & HX lines—methyl formate (CH_3COOH); all others—sulphur dioxide

Control
Make of control ..... General Electric
Type of control ..... Temperature
Temperature regulation method .. Manually
How defrosted ..... All but S & P lines—semi-automatic

Condenser
Make of condenser ..... General Electric
Method of cooling ..... HE line—fan; others—natural draft
Type of condenser ... HE line—finned tube; HT & HX—formed steel; others—copper tube

Special Features
Models HT-70 & HX-70—foot pedal door opener, electric light; all but HE models—vegetable tray; HE line—push-open type door latch.

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... HE line—1 year; others—1 year plus 4-year service contract
Repairs made by ..... Factory, minor adjustments in field
Are replacement parts sold to independent service companies ..... No

Sanitary Electric

Style - Performance - Quality - Price

Suggested Resale Prices

Model 41— 4.1 cubic feet .. $ 89.75
Model 45— 4.5 cubic feet .. 105.00
Model 68— 6.9 cubic feet .. 148.60
Model 75— 7.6 cubic feet .. 172.75
Model 98— 9.9 cubic feet .. 198.20
Model 120—12.2 cubic feet .. 265.00

DEALERS
Write for exclusive dealer franchise.

DISTRIBUTORS
Write for exclusive distributors territory.

Sanitary Electric Corporation
Fond du Lac, Wisconsin

Kelvinator

Kelvinator Corp., 14250 Plymouth Road, Detroit, Mich.

Model No.	N	NA	NB	SA	SB	SC	PA	PB
Cabinet Specifications								
Overall dimensions (in.)								
Height	50½	52¼	57⅛	51¾	56½	57¼	51¾	56½
Width	24⅜	27⅞	27⅞	29⅜	29⅜	32½	29⅜	29⅜
Depth	24¼	25¾	25¾	26¾	26¾	26¾	26¾	26¾
Inside dimensions of liner (in.)								
Height	24⅛	24⅝	29½	25⅝	29½	30¼	24⅝	29½
Width	19¾	22⅛	22⅛	22⅛	22⅛	25¼	22⅛	22⅛
Depth	17	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝	18⅝
No. of doors	1	1	1	1	1	1	1	1
Storage Capacity								
Gross food storage (cu. ft.)	4.68	5.89	7.03	5.89	7.03	8.22	5.89	7.03
Net food storage (cu. ft.)	4.22	5.29	6.43	5.29	6.35	7.54	5.13	6.17
No. of shelves	3	3	4	3	4	4	3	4
Total shelf area (sq. ft.)	8.35	10.53	13.39	10.53	12.5	14.14	10.66	12.8
Ice Cube Trays								
No. of trays	2	3	3	3	4	4	3	4
No. of cubes produced	42	63	63	63	84	84	81	108
Weight of cubes (lbs.)	3.4	5.1	5.1	5.1	6.8	6.8	8.25	11.0
Thickness of Insulation (in.)								
Top	2	2½	2½	2½	2½	2½	2½	2½
Sides	2	2½	2½	2½	2½	2½	2½	2½
Bottom	2½	2½	2½	2½	2½	2½	2½	2½
Compressor Specifications								
Compressor capacity I.M.E. (lbs.)	100	100	114	100	114	147.4	100	114
Motor size (hp.)	1/6	1/6	1/6	1/6	1/6	1/4	1/6	1/6
Compressor speed (r.p.m.)	640	640	410	640	410	525	640	410
Compressor bore (in.)	1¼	1¼	1¼	1¼	1¼	1¼	1¼	1¼
Compressor stroke (in.)	1½	1½	1½	1½	1½	1¼	1½	1½
No. of cylinders	1	1	2	1	2	2	1	2
Lubricant in system (oz.)	19	19	26	19	26	26	19	26
Refrigerant in system (oz.)	45	50	47	50	50	50	50	55

Model No.	PC	PD	D-2	D-3	D-4	D-5	D-6	D-7
Cabinet Specifications								
Overall dimensions (in.)								
Height	57¼	62¾	57¼	62¾	66⅞	66⅞	73⅞	73⅞
Width	32½	32⅝	32⅝	33⅝	38	49	49	68¾
Depth	26¾	27¼	26¾	27¼	29	29	29	29
Inside dimensions of liner (in.)								
Height	30¼	35½	30⅛	35⅛	34½	34½	41½	41½
Width	25¼	25¼	25¼	25¼	28¼	39¼	39¼	59
Depth	18⅝	18⅝	18⅝	18⅝	19	19	19	19
No. of doors	1	1	1	1	2	2	2	2
Storage Capacity								
Gross food storage (cu. ft.)	8.22	9.59	8.22	9.59	10.71	14.9	17.95	26.95
Net food storage (cu. ft.)	7.36	8.73	6.58	7.52	9.03	12.68	15.25	23.32
No. of shelves	4	5	4	5	6	5	6	11
Total shelf area (sq. ft.)	14.43	17.7	12.94	16.2	18.42	25.05	30.63	45.55
Ice Cube Trays								
No. of trays	4	4	3	4	4	6	7	9
No. of cubes produced	108	108	81	108	108	162	189	243
Weight of cubes (lbs.)	11.0	11.0	13.75	16.5	16.5	25.75	28.5	34.0
Thickness of Insulation (in.)								
Top	2½	3	2½	3	3½	3½	3½	3½
Sides	2½	3	2½	3	3½	3½	3½	3½
Bottom	2½	3	2½	3	3½	3½	3½	3½
Compressor Specifications								
Compressor capacity I.M.E. (lbs.)	147.4	147.4	147.4	147.4	199	199	324	324
Motor size (hp.)	1/4	1/4	1/4	1/4	1/3	1/3	1/3	1/3
Compressor speed (r.p.m.)	525	525	525	525	640	640	575	575
Compressor bore (in.)	1¼	1¼	1¼	1¼	1¼	1¼	1½	1½
Compressor stroke (in.)	1½	1½	1½	1½	1½	1½	1¾	1¾
No. of cylinders	2	2	2	2	2	2	2	2
Lubricant in system (oz.)	26	26	26	26	26	26	32	32
Refrigerant in system (oz.)	55	55	21	21	23	23	27	27

Note: Models NAS, SAS, and PAS have larger condensing units than models NA, SA, and PA and are for operation in southern states. Thus, NAS and SAS have two-cylinder compressors operating at 410 r.p.m. to produce 114 lbs. I.M.E. Model PAS also has a two-cylinder compressor, operating at 525 r.p.m., and has a capacity of 147.4 lbs. I.M.E.

* * *

Cabinet Materials
Make of cabinet ..... Kelvinator
Material used for frame .... Spruce & steel
Finish of shelves ..... Tinned
Materials for breaker strip ... Composition
Material used for gasket ..... Rubber "balloon type"

Finish
Cabinet finish (exterior) ..... S & N lines—lacquer; P & D lines—porcelain
Cabinet finish (interior) ..... Porcelain

Hardware
Process of manufacture ..... Stamped
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Compressor
Make of compressor ..... Kelvinator
Type of system ..... Conventional
Type of compressor ..... Reciprocating
Compressor drive ..... V-belt
Type of shaft seal ..... Kelvinator bellows
Location of compressor ..... Below

Motor
Type of motor ..... Models SC, PC, PD, D-2, & D-3—capacitor; others—repulsion-induction

Refrigerant
Refrigerant used ..... Sulphur dioxide

Lubrication
How often should motor be oiled ..... Annually

Control
Make of control ..... Ranco
Type of control ..... Temperature
Temperature regulation method ... Manual
How defrosted ..... Wide cycle defrost with automatic return

Special Features
Interior electric light on all but N models; vegetable tray on P & D models; cooling pitcher on D models; "Food Filing" trays on D line.

Evaporator
Make of evaporator ..... Kelvinator
Evaporator construction ..... Shell
Metal used ..... Copper
Type of refrigerant control ..... High side float
Type of ice cube trays .. Aluminum; also, "Dry Cube" and "Flexo-Trays"

Condenser
Make of condenser ..... Kelvinator
Method of cooling ..... Fan
Type of condenser ..... Finned tube

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... 1 year
Serviced by .... Dealers and distributors
Are replacement parts sold to independent service companies ..... No

Jewett

The Jewett Refrigerator Co., Buffalo, N. Y.

Model No.	JK-65	D-70	80	100
Cabinet Specifications				
Overall dimensions (in.)				
Height	60⅛	54⅞	67½	67½
Width	28⅛	27⅛	40¼	42¼
Depth	22⅛	24½	25¼	25¼
No. of doors	1	1	3	3
Storage Capacity				
Gross food storage (cu. ft.)	6.4	7.0	10.0	12.0
Net food storage (cu. ft.)	5.7	6.5	8.0	10.0
No. of shelves	3	4	5	5
Total shelf area (sq. ft.)	10.7	12.8	11.0	13.0
Ice Cube Trays				
No. of trays	3	4	5	5
No. of cubes	84	112	140	140
Weight of cubes (lbs.)	7.75	10.3	12.9	12.9
Thickness of Insulation (in.)				
Top	3	3	5	5
Side	3	3	5	5
Bottom	3	3	5	5
Compressor Specifications				
Compressor capacity I.M.E. (lbs.)	85	95	120	120
Motor size (hp.)	1/6	1/6	1/4	1/4
Compressor speed (r.p.m.)	500	1725	500	500
Bore (in.)	1-5/16	...	1-5/16	1-5/16
Stroke (in.)	1-3/16	...	1-3/16	1-3/16
No. of cylinders	1	...	1	1
Price, installed	$150	$170	$550	$600
Weight, shipping (lbs.)	375	400	1300	1400

Cabinet Materials
Make of cabinet ..... Jewett
Material used for frame ..... Wood
Finish of shelves ..... Tinned
Material used for breaker strip .... JK-65 & D-70—stainless steel; 80 & 100—wood
Material used for gasket ..... Rubber
Make of insulation ..... Temlok

Finish
Cabinet finish (exterior) ... JK-65 & D-70—lacquer; 80 & 100—porcelain
Cabinet finish (interior) .... JK-65 & D-70—porcelain on steel; 80 & 100—solid porcelain liner

Hardware
Process of manufacture ..... Stamped
Basic metal of hardware ..... Brass
Finish of hardware ..... Chrominum

Compressor
Make of compressor .. D-70—Jewett; others—Kellogg
Type of system ..... Conventional
Type of compressor ..... D-70—rotary; others—reciprocating
Compressor drive ..... D-70—close coupled; others—direct
Type of shaft steel ..... Bellows
Location of compressor ..... D-70—above; others—below

Refrigerant
Refrigerant used ... D-70—sulphur dioxide; others—methyl chloride
Amount in system ..... D-70—2½ lbs. others—1 lb.

Lubrication
Brand of compressor lubricant ..... Stanco
Quantity in system ..... 1 pt.
How often should motor be oiled . Annually
Control ..... D-70—Cutler-Hammer; others—Ranco

Type of control ..... Temperature
Temperature regulation method ... Manual

Motor
Make of motor ..... D-70—Wagner; others—Delco
Type of motor ..... D-70—Capacitor; others—repulsion-induction

Evaporator
Make of evaporator ..... JK-65—McCord; others—Fedders
Evaporator construction ..... Tubular
Metal used ..... Copper
Type of refrigerant control .... Expansion valve
Make of expansion valve ..... Detroit
Type of ice trays ..... Aluminum

Condenser
Make of condenser ..... D-70—Jewett; others—Bush
Method of cooling ..... Fan
Type of condenser ..... Finned tube

Special Features
D-70—low temperature "Chill Drawer"; 80 & 100—solid porcelain liners.

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... 1 year
Serviced by ..... Dealer

Potter

Potter Refrigerator Corp., 220 Delaware Ave., Buffalo, N. Y.

Model No.	L5	L6	L7	L104		L132		D100		D130		D150	
Cabinet Specifications													
Overall dimensions (in.)													
Height	57½	57¾	63¼	57¾		63¼		57¾		63¼		65½	
Width	23½	29½	29½	29½		29½		29½		29½		33½	
Depth	20½	22⅞	22⅞	22⅞		22⅞		22⅞		22⅞		22⅞	
				*G. S.	F. S.	G. S.	F. S.	G. S.	F. S.	G. S.	F. S.	G. S.	F. S.
Height	31	29	34½	15½	9	22	9	16¾	9	22¼	9	22¼	10½
Width	19¼	24	24	24	20	24	20	24	20	24	20	28	24
Depth	16½	17	17	17	12	17	12	16⅛	15⅛	16⅛	15⅛	16⅛	15⅛
No. of doors	1	1	1	1		1		1		1		2	
Storage Capacity													
No. of shelves	5	5	6	5		6		5		6		6	
Total shelf area (sq. ft.)	9.9	11.3	14.5	10.4		13.2		10.3		13.0		15.0	
Ice Cube Trays													
No. of trays	3	3	4	3		3		3		3		4	
No. of cubes	84	84	112	84		84		84		84		112	
Weight of cubes (lbs.)	6	6	8	6		6		6		6		8	
Thickness of Insulation (in.)								*G. S.	F. S.	G. S.	F. S.	G. S.	F. S.
Top	3	3	3	3		3		3	...	3	...	3	...
Sides	2	2¾	2¾	2¾		2¾		2¾	4¾	2¾	4¾	2¾	4¾
Bottom	3	4	4	4		4		...	5	...	5	...	5
Compressor Specifications													
Compressor capacity (lbs.)	I.M.E. 120	120	120	120		120		120		120		166	
Motor size (hp.)	⅛	⅛	⅛	⅛		⅛		⅛		⅛		¼	
Compressor speed (r.p.m.)	430	430	430	430		430		430		430		430	
Compressor bore (in.)	1½	1½	1½	1½		1½		1½		1½		1¾	
Compressor stroke (in.)	1¼	1¼	1¼	1¼		1¼		1¼		1¼		1¼	
No. of cylinders	1	1	1	1		1		1		1		1	
Price, installed	$164	$195	$234	$229		$272		$264		$308		$369	
Weight, total shipping (lbs.)	375	420	430	450		475		480		520		580	

*G.S.—general food storage
F.S.—frozen storage

* * *

Cabinet Materials
Make of cabinet .....Rex
Finish of shelves.....L models—tinned; D models—porcelain
Material used for breaker strip..Panelyte
Material used for gasket .....Rubber
Make of insulation.....Balsam Wool

Finish
Cabinet finish (exterior).....L models—lacquer; D models—porcelain
Cabinet finish (interior) .....Porcelain

Hardware
Make of hardware....Grand Rapids Brass
Process of manufacture ..Cast & stamped
Basic metal of hardware .....Brass
Finish of hardware .....Chromium

Compressor
Make of compressor ....Universal Cooler
Type of system .....Conventional
Type of compressor .....Reciprocating
Compressor drive .....Belt
Type of shaft seal .....Bellows
Location of compressor .....Below

Refrigerant
Refrigerant used .....Methyl chloride
Trade name .....Artic
Amount in system...Model D-160—1½ lbs; others—1 lb.

Lubrication
Brand of compressor lubricant.....Argon
Quantity in system.....¾ pt.
How often should motor be oiled..Every 3 months

Control
Make of control.....Cutler-Hammer
Type of control .....Temperature
Temperature regulation method ....Fixed

Condenser
Make of condenser.....Long
Method of cooling .....Fan
Type of condenser .....Finned tube

Evaporator
Make of evaporator .....Potter
Evaporator construction..First evaporator—continuous coil in sleeve; second evaporator—continuous large area finned coil
Metal used .....Aluminum & copper
Make of expansion valve.....Mayson
Type of ice cube trays....Aluminum, one rubber tray in each

Motor
Make of motor .....Wagner
Type of motor.....Repulsion-induction

Special Features
Electric light; porcelain shelves; five-way door latch; frozen storage compartment maintains low temperatures for frozen foods; beverage compartment; fruit & vegetable storage.

Policy
Guarantee on cabinet .....1 year
Guarantee on system .....1 year
Serviced by .....Distributor or dealer
Are replacement parts sold to independent service companies .....Yes

Universal Cooler

Universal Cooler Corp., 7424 Melville Ave., Detroit, Mich.

Model No.	400	402	455	503 503-P	604 604-P	705 705-P
Cabinet Specifications						
Overall dimensions (in.)						
Height	47½	54⅞	52½	58⅞	61	63
Width	24	23⅞	24	26¼	30	36¼
Depth	19⅛	20	19⅛	22	22½	27½
Inside dimensions of liner (in.)						
Height	21	26¼	24	29	30	31½
Width	20⅜	19¼	20¼	20¾	23½	29¾
Depth	15½	15¾	15¾	17	17	15½
No. of doors	1	1	1	1	1	2
Storage Capacity						
Gross food storage (cu. ft.)	4.0	4.6	4.42	5.92	6.93	8.4
Net food storage (cu. ft.)	3.5	4.1	4.0	5.18	6.01	7.47
No. of shelves	3	3	3	4	4	4
Total shelf area (sq. ft.)	6.6	8.0	8.0	11.6	13.0	15.5
Ice Cube Trays						
No. of trays	2	2	2	3	4	5
No. of cubes produced	36	56	56	84	112	140
Weight of cubes (lbs.)	3	4	4	6	8	10
Thickness of Insulation (in.)						
Top	1½	2	1½	2½	3	3½
Sides	1½	2	1½	2½	3	3
Bottom	2	2½	2	2½	3	3½
Compressor Specifications						
Compressor capacity I.M.E. (lbs.)	96	96	96	96	96	96
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	430	430	430	430	430	430
Compressor bore (in.)	1½	1½	1½	1½	1½	1½
Compressor stroke (in.)	1¼	1¼	1¼	1¼	1¼	1¼
No. of cylinders	1	1	1	1	1	1
Weight, net (lbs.), lacquer models	190	240	215	273	320	390
Net (lbs.), porcelain models	...	...	...	293	345	435
Price, installed in Detroit, Mich., state tax additional						
Lacquer models	...	$127	113.50	141.25	167	189
Porcelain models	...	...	...	$151.25	177	199

* * *

Cabinet Materials
Make of cabinet.....Truscon
Materials used for frame....Models 400 & 455—wood; others—steel
Finish of shelves.....Tinned
Material used for breaker strip.....Wood
Material used for gasket.....Rubber
Make of gasket.....Miller
Make of insulation.....Thermocraft

Finish
Cabinet finish (exterior).....P models—porcelain; others—lacquer
Cabinet finish (interior).....Porcelain

Hardware
Make of hardware...Grand Rapids Brass
Basic metal of hardware.....Brass
Finish of hardware.....Chromium

Compressor
Make of compressor.....Universal Cooler
Type of system.....Conventional
Type of compressor.....Reciprocating
Compressor drive.....Belt
Type of shaft seal.....Bellows
Location of compressor.....Below

Refrigerant
Refrigerant used.....Methyl chloride
Amount in system.....1 lb.

Lubrication
Brand of compressor lubricant.....Argon
Quantity in system..... 1 pt.
How often should motor be oiled..Annually

Control
Make of control.....Tagliabue
Type of control.....Temperature
Temperature regulation method....Manual
How defrosted.....Wide range defroster

Motor
Make of motor.....Howell or Wagner
Type of motor.....Repulsion-induction

Evaporator
Make of evaporator.....Universal Cooler
Evaporator construction.....Tubular
Metal used.....Copper & brass
Type of refrigerant.....Expansion valve
Make of expansion valve.....Detroit Lubricator
Type of ice trays...Aluminum; 1 Flexotray in all but model 400

Condenser
Make of condenser....Bush & Long Mfg. Co.
Method of cooling.....Fan
Type of condenser.....Finned tube

Special Features
Fast freezing dessert compartment in all but 400, 402, & 455. Interior light in all but 400 & 455.

Policy
Guarantee on cabinet.....1 year
Guarantee on system.....1 year
Serviced by.....Distributor
Are replacement parts furnished to independent service companies.....Yes

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Norge

Norge Corp., 670 E. Woodbridge St., Detroit, Mich.

Model No.	S-44	SP-47 S-47	SP-55 S-55	SP-71 S-71	P-54 L-54	P-67 L-67	P-78	P-91	P-110
Cabinet Specifications									
Overall dimensions (in.)									
Height	51½	52¼	55¼	60	54⅝	58⅞	60⅞	60⅞	60⅞
Width	23½	24	26¾	28⅜	26⅞	29½	32½	40⅝	48⅞
Depth	24⅛	23⅞	25¼	26⅜	27⅛	27⅛	28⅞	28⅞	28⅞
Inside dimensions of liner (in.)									
Height	25⅞	25⅞	27⅞	32⅛	26⅞	31	32	31½	36⅛
Width	20¼	20¼	22	22⅝	22	22⅝	25⅝	33	34
Depth	16¼	16¼	16¼	18⅝	16⅛	16⅝	17½	16½	17⅝
No. of doors	1	1	1	1	1	1	1	2	2
Storage Capacity									
Gross food storage (cu. ft.)	5.1	5.1	5.9	7.7	5.9	7.2	8.3	10.38	12.81
Net food storage (cu. ft.)	4.7	4.7	5.5	7.1	5.4	6.7	7.8	9.08	11.05
No. of shelves	3	3	3	5	3	6	6	6	6
Total shelf area (sq. ft.)	9.2	9.2	11.0	14.1	11.1	13.8	15.4	19.27	24.6
Ice Cube Trays									
No. of trays	2	2	3	4	3	3	3	3	8
No. of cubes produced	42	48	72	96	72	96	96	96	168
Weight of cubes (lbs.)	4½	5¼	7⅞	10½	7¼	9¾	9¾	9¾	16
Compressor Specifications									
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛	⅛	¼	¼

* * *

Cabinet Materials
Make of cabinet.....Norge
Materials used in frame.....Wood
Finish of shelves.....Tinned
Material used for breaker strip.....Wood
Material used for gasket.....Rubber

Finish
Cabinet finish (exterior).....SP & P models—porcelain; others—lacquer
Cabinet finish (interior).....Porcelain

Hardware
Process of manufacture.....Stamped & forged
Basic metal of hardware.....Brass
Finish of hardware.....Chromium

Compressor
Make of compresser.....Norge
Type of system.....Conventional
Type of compressor.....Rotary
Compressor drive.....Belt
Type of shaft seal.....Bellows
Location of compresser.....Below

Refrigerant
Refrigerant used.....Sulphur dioxide

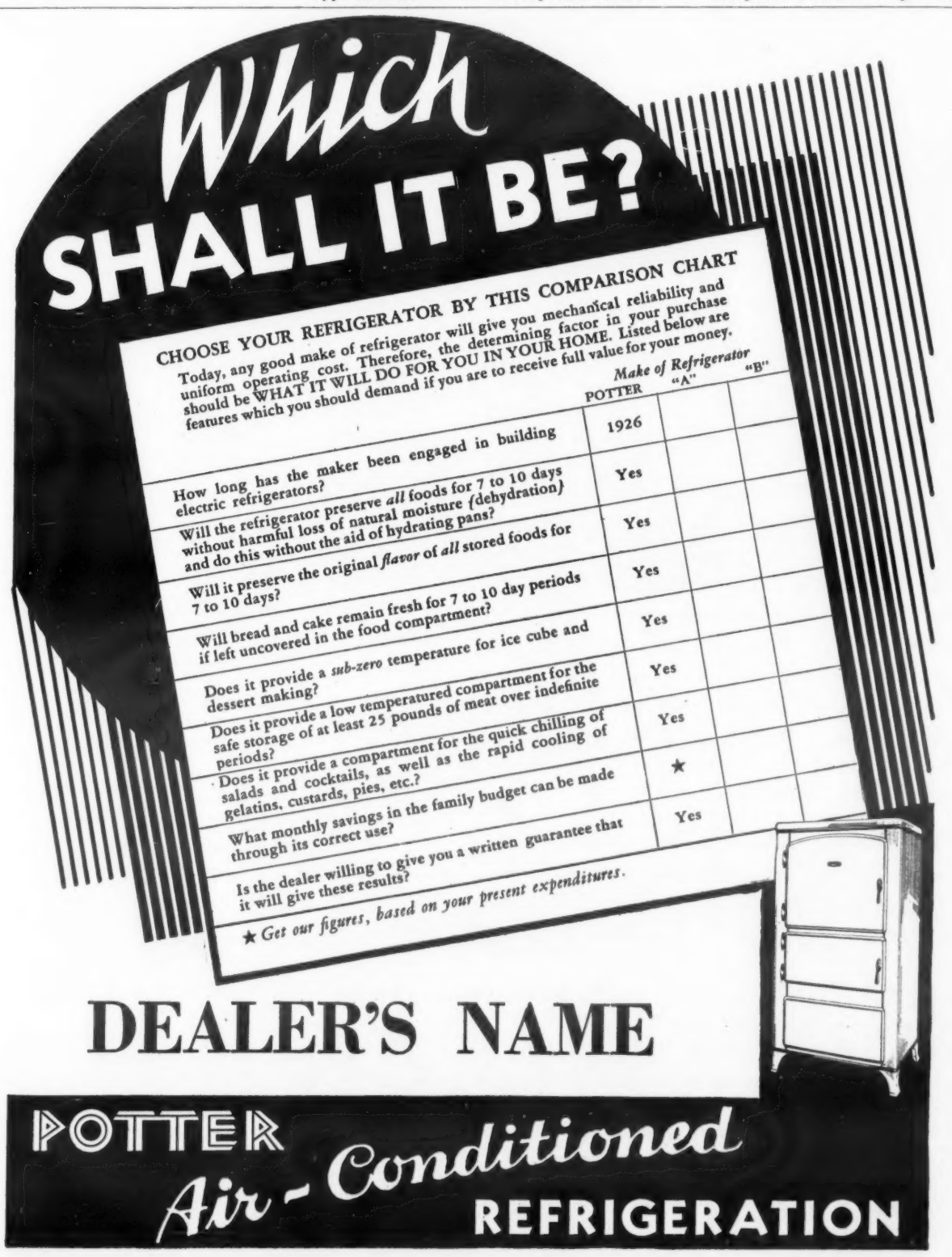
Motor
Type of motor.....Capacitor—start

Control
Type of control.....Temperature
Temperature regulation method....Manual
How defrosted.....Defrosting position on control

Evaporator
Make of evaporator.....Norge
Evaporator construction.....Shell & tube
Metal used.....Copper & brass
Type of refrigerant control.....Low side float
Type of ice trays....Aluminum & rubber
Method of cooling.....Fan
Type of condenser.....Finned tube

Special Features
Interior electric light standard in all models except S-44; optional at additional cost in S-44. Cheese rack, egg basket, and "Hydrovoir" all L and P models.

Policy
Guarantee on cabinet.....1 year
Guarantee on system.....1 year
Serviced by.....Dealer and distributor
Are replacement parts furnished to independent service companies....No


Which
SHALL IT BE?
CHOOSE YOUR REFRIGERATOR BY THIS COMPARISON CHART
Today, any good make of refrigerator will give you mechanical reliability and uniform operating cost. Therefore, the determining factor in your purchase should be WHAT IT WILL DO FOR YOU IN YOUR HOME. Listed below are features which you should demand if you are to receive full value for your money.
Make of Refrigerator
POTTER "A" "B"
How long has the maker been engaged in building electric refrigerators? 1926
Will the refrigerator preserve all foods for 7 to 10 days without harmful loss of natural moisture (dehydration) and do this without the aid of hydrating pans? Yes
Will it preserve the original flavor of all stored foods for 7 to 10 days? Yes
Will bread and cake remain fresh for 7 to 10 day periods if left uncovered in the food compartment? Yes
Does it provide a sub-zero temperature for ice cube and dessert making? Yes
Does it provide a low temperatured compartment for the safe storage of at least 25 pounds of meat over indefinite periods? Yes
Does it provide a compartment for the quick chilling of salads and cocktails, as well as the rapid cooling of gelatins, custards, pies, etc.? ★
What monthly savings in the family budget can be made through its correct use? Yes
Is the dealer willing to give you a written guarantee that it will give these results?
★ Get our figures, based on your present expenditures.
DEALER'S NAME
POTTER Air-Conditioned REFRIGERATION

... Some high grade dealer in your city is going to run this kind of advertising over his name in your local paper. He will have the sales rights to sell this incomparable refrigerator in your community. Will that dealer be you?

WRITE, WIRE OR PHONE

POTTER REFRIGERATOR CORPORATION

BUFFALO, NEW YORK

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Name .....

Attention of / In Care of .....

Street Address .....

City and State .....

We sell the.....refrigerator and.....
(Please indicate other products or principal line of business.)

The above rates apply only to United States and Possessions and Pan-American Postal Union Countries. Rate for Canada—Directory, $6.00; News, $6.00; Combination, $11.00. Rate for all other foreign countries—Directory, $5.00; News, $5.00; Combination, $9.00.

Crosley

Crosley Radio Corp., Cincinnati, Ohio

Model No.	EA-35	EA-43	EA-55	E-43	E-55	E-70
Cabinet Specifications						
Overall dimensions (in.)						
Height	48¾	54¾	57⅛	56⅝	57⅛	58⅞
Width	23⅞	23⅞	29	23⅞	29	32¾
Depth	24⅞	24½	25⅞	24½	25⅞	26⅞
No. of doors	1	1	1	1	1	1
Storage Capacity						
Net food storage (cu. ft.)	3.5	4.3	5.51	4.3	5.51	7.05
Gross food storage (cu. ft.)	3.75	4.72	6.27	4.72	6.27	7.75
Net capacity, less door	...	...	...	...	...	6.27
Shelf area, less door	6.35	7.85	9.62	7.85	9.62	10.97
Shelf area outside of food compartment	...	...	...	1.2	1.6	1.9
No. of shelves	3	4	4	4	4	4
Total shelf area (sq. ft.)	7.5	9.15	11.6	9.15	11.6	14.9
Shelf area less door (sq. ft.)	6.35	7.85	9.62	7.85	9.62	10.97
Ice Cube Trays						
No. of trays	2	3	4	3	4	5
No. of cubes produced	42	63	84	63	84	105
Weight of cubes (lbs.)	2.6	3.9	5.2	3.9	5.2	6.5
Thickness of Insulation (in.)						
Top	2¾	2¾	2¾	2¾	2¾	2¾
Sides	2⅞	2⅞	3¼	2⅞	3¼	3½
Bottom	2¾	2¾	3¼	2¾	3¼	3½
Compressor Specifications						
Compressor capacity (lbs. I.M.E.) at zero gauge, 100° F. room temperature	100	100	100	100	100	100
Motor size (hp.)	⅛*	⅛*	⅛*	⅛*	⅛*	⅛†
Compressor speed (r.p.m.)	540	540	540	540	540	...
Compressor bore (in.)	1½	1½	1½	1½	1½	1½
Compressor stroke (in.)	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜
No. of cylinders	1	1	1	1	1	1
Price, delivered and installed	$ 99.50	$117.00	$145	$130	$150.00	$175
Price with porcelain exterior	$119.50	$139.50	$170	$155	$177.50	$205

* * *

Cabinet Materials
Make of cabinet.....Crosley & Rex
Material used for frame.....Wood
Finish of shelves.....Tinned
Material used for breaker strip.....Wood
Material used for gasket.....Rubber
Make of insulation .....Balsam Wool

Finish
Cabinet finish, exterior.....Lacquer, porcelain on special order
Cabinet finish, interior .....Porcelain

Hardware
Process of manufacture.....Stamped
Basic metal of hardware.....Brass
Finish of hardware .....Chromium

Control
Make of control.....Tagliabue
Type of control.....Temperature
Temperature regulation method....Manual
How defrosted.....Wide cycle position on switch

Evaporator
Make of evaporator.....Crosley
Evaporator construction .....Shell
Metal used .....Steel
Type of refrigerant control.Capillary tube
Type of ice cube trays.....Aluminum

Motor
Make of motor.....Delco
Type of motor .....Capacitor

Compressor
Make of compressor .....Crosley
Type of system .....Conventional
Type of compressor .....Reciprocating
Compressor drive .....Belt
Location of compressor .....Above

Condenser
Method of cooling.....Fan
Type of condenser.....Finned tube

Refrigerant
Refrigerant used.....Sulphur dioxide
Amount in system.....2 lbs.

Lubrication
Brand of compressor lubricant.....Suniso
Quantity in system.....15 oz.
How often should motor be oiled...3 years

Special Features
"Shelvador" and interior electric light on all models. "Shelvatray," "Shelvabasket," and "Stora-bin" on E-43, E-55, and E-70.

Policy
Guarantee on cabinet .....1 year
Guarantee on system .....1 year
Serviced by..Dealer, distributor, & factory

*Foreign models use ⅛ hp. motor.
†Foreign models used ¼ hp. motor.

Gibson

Gibson Electric Refrigerator Corp., Greenville, Mich.

Model No.	LR 494	LR 504	LR574 PR574	SR 534	SR 724	LR634 PR634	LR774 PR774	L2-864 P2-864
Cabinet Specifications								
Overall dimensions (in.)								
Height	56⅞	50⅝	52⅛	53⅝	60⅝	55¼	58⅞	59½
Width	24¾	24½	27	26	29	29¾	34⅛	35¾
Depth	23⅜	28⅜	28⅜	28½	30	29⅜	30⅜	30⅜
Inside dimensions of liner (in.)								
Height	32	25¼	27¼	25¼	31¾	27⅝	30¼	30⅞
Width	18½	18⅜	20⅞	21	22	22⅝	25	27⅝
Depth	13¾	18⅜	17½	17	17	17	17⅜	17⅜
No. of doors	1	1	1	1	1	1	1	2
Storage Capacity								
Gross food storage (cu. ft.)	4.71	4.97	5.76	5.22	6.86	6.32	7.65	8.6
Net food storage (cu. ft.)	4.50	4.72	5.51	4.94	6.56	6.05	7.36	8.0
No. of shelves	3	3	3	3	4	4	4	4
Total shelf area (sq. ft.)	7.41	8.08	9.33	8.69	11.77	11.62	13.1	14.103
Ice Cube Trays								
No. of trays	3	2	2	2	3	3	4	4
No. of cubes produced	63	63	63	56	77	77	98	98
Weight of cubes (lbs.)	3¾	3¾	3¾	3¾	5	5	6¼	6¼
Thickness of Insulation (in.)								
Top	2	2	2	2	2	2	2	2
Sides	2½	2½	3	2½	3	3½	4	4
Bottom	2½	3	3½	3	3½	4	4½	4½
Compressor Specifications								
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	1740	1740	1740	1740	1740	1740	1740	1740
Compressor bore (in.)	1-1/16							
Compressor stroke (in.)	⅝	⅝	⅝	⅝	⅝	⅝	⅝	⅝
No. of cylinders	2	2	2	2	2	2	2	2
Refrigerant in system (oz.)	35	35	35	35	39	39	43	43
Weight								
Shipping (lbs.) L & S models	301	318	360	325	381	415	457	499
Shipping (lbs.) P models	...	...	435	...	...	445	482	533

* * *

Cabinet Materials
Make of cabinet .....Gibson
Materials used for frame.....Models 634, 774, 864 & PR574—steel; others—wood & steel
Finish of shelves.....Tinned
Material used for breaker strip..Rubber & Panelyte
Material used for gasket .....Rubber
Make of gasket.....Dryden Rubber Co.

Finish
Cabinet finish (exterior).....L & S models—lacquer; P models—porcelain
Cabinet finish (interior) .....Porcelain

Hardware
Make of hardware....Grand Rapids Brass
Process of manufacture .....Cast
Basic metal of hardware.....Manganese bronze
Finish of hardware.....Nickel-chromium plated

Motor
Make of motor...Delco or General Electric
Type of motor .....Capacitor-start

Compressor
Make of compressor .....Gibson
Type of system.....Hermetically sealed
Type of compressor.....Reciprocating
Compressor drive .....Direct
Location of compressor .....Top

Refrigerant
Refrigerant used.....Sulphur dioxide

Control
Make of control .....Ranco
Type of control .....Temperature
Temperature regulation method....Manual
How defrosted ....Defrosting position on control

Evaporator
Make of evaporator .....Mullins
Evaporator construction .....Shell
Metal used.....Porcelain on steel
Type of refrigerant control.....High side float
Type of ice cube trays .....Aluminum

Lubrication
Brand of compressor lubricant....Sunoco
Quantity in system.....12 oz.

Condenser
Make of condenser.....McCord & Long
Method of cooling .....Fan
Type of condenser .....Finned tube

Special Features
Dome light, "Prestoe" foot pedal door opener, and butter and egg tray in all models except 494, 504, and 574.

Policy
Guarantee on cabinet.....1 year
Guarantee on system .....1 year
Serviced by.....Distributor & Dealer
Are replacement parts sold to independent service companies .....No

*Low-temperature comp., 11½ in. wide.

King Zeero to Make & Sell Morrison Products

CHICAGO—The King Zeero Co. at 3118 Clybourn Ave. here has contracted with the Morrison Mfg. Co. to manufacture and distribute the line of refrigerating equipment and accessories formerly built by the Morrison Co.

Included in the equipment which the King Zeero Co. will manufacture are float valves, float controls for milk coolers, and ice cream freezers, unit air coolers, suction pressure control valves, accumulators, oil traps, brine coolers, shell and tube condensers, water coolers, welded tanks and headers, header type coils, and fin coils.

According to J. I. Morrison, manager of the King Zeero Co., the basic line of ammonia float valves has been revamped and redesigned to embody many improvements, including: accessibility to the needle and seat without pumping out the coils or breaking a pipe joint, and improved strainer and float.

Jomoco

Johnson Motor Co., Waukegan, Ill.

Model No.	L-4	L-5 P-5	L-6 P-6	P-8
Cabinet Specifications				
Overall dimensions (in.)				
Height	50⅞	53⅞	56	56
Width	25½	26½	30½	38¾
Depth	23⅛	24⅝	24⅝	24⅝
No. of doors	1	1	1	2
Storage Capacity				
Gross food storage (cu. ft.)	4.67	5.85	6.88	9.34
Net food storage (cu. ft.)	4.06	5.02	6.0	8.4
No. of shelves	3	3	3	5
Total shelf area (sq. ft.)	8.2	9.1	10.1	14.2
Ice Cube Trays				
No. of trays	3	3	3	6
No. of cubes	63	63	63	126
Weight of cubes (lbs.)	3¾	3¾	3¾	7½
Thickness of Insulation (in.)				
Top	2	2½	3	3
Sides	2	2½	3	3
Bottom	2	2½	3	3
Price, L models, installed	$114.50	139.50	159.50	...
Price, P models, installed	...	164.50	189.50	249.50
Compressor Specifications				
Compressor capacity (lbs.) I.M.E.	98.4			
Motor size (hp.)	1/5			
Compressor speed r.p.m.	1725			
Compressor bore (in.)	1 1/16			
Compressor stroke (in.)	33/64			
No. of cylinders	2			
Finish				
Cabinet finish (exterior)	Elasto lacquer			
Cabinet finish (interior)	Porcelain			
Hardware				
Make of hardware	National Lock			
Process of manufacture	Cast			
Basic metal of hardware	Bronze			
Finish of hardware	Chromium			
Cabinet Materials				
Make of cabinet	Seeger			
Material used for frame	Wood			
Finish of shelves	Tinned			
Material used for breaker strip	Bakelite			
Material used for gasket	Rubber			
Make of insulation	Insulite			
Motor				
Make of motor	General Electric			
Type of motor	Capacitor			
Compressor				
Make of compressor	Jomoco			
Type of system	Conventional			
Type of compressor	Reciprocating			
Compressor drive	Direct			
Type of shaft seal	Bellows			
Location of compressor	Above			
Refrigerant				
Refrigerant used	Sulphur dioxide			
Amount in system	24 oz.			
Lubrication				
Brand of compressor lubricant	Suniso			
Quantity in system	14 oz.			
How often should motor be oiled	Semi-annually			
Control				
Make of control	General Electric			
Temperature regulation method	Manual			
How defrosted	Defrosting cycle on control			
Evaporator				
Make of evaporator	Jomoco			
Evaporator construction	Shell & tube			
Metal used	Brass & Copper			
Make expansion valve	Detroit Lubricator			
Type of ice cube trays	Aluminum			
Condenser				
Make of condenser	Bush			
Method of cooling	Fan			
Type of condenser	Finned tube			
Policy				
Guarantee on cabinet	1 year			
Guarantee on system	1 year			
Serviced by	Dealer & distributor			
Are replacement parts sold to independent service companies	Yes			

McCORD
REFRIGERATION
PRODUCTS

◇

COMMERCIAL EVAPORATORS

◆

DOMESTIC EVAPORATORS

◆

CONDENSERS

◆

METLFLEX ICE TRAYS

◆

SPIRAL FINNED TUBING

◆

SPIRAL COPPER FINNED IRON, STEEL OR COPPER PIPE

◇

McCORD RADIATOR & MFG. CO.
DETROIT. -:- MICH.

Frigidaire

Frigidaire Corp., Dayton, Ohio

Model No.	Deluxe 1234	Deluxe 1534	Super 1534	Super 1234	Super 934	Super 734	Super 634	Super 434
Cabinet Specifications								
Overall Dimensions (in.)								
Height	65	65	65	65	64⅞	61¾	60¾	55⅛
Width	38⅞	46¾	46¾	38⅞	32¼	28¾	26	24⅛
Depth	28⅞	28⅞	28⅞	28⅞	25⅜	25⅜	24¾	21½
Inside dimensions of liner (in.)								
Height	35⅜	35⅜	35½	35½	36¼	33⅛	32¼	28¼
Width	32	39⅞	39⅞	32	26¼	22⅞	20½	19¼
Depth	19⅝	19⅝	19¾	19¾	17½	17½	17	14
No. of doors	2	2	2	2	1	1	1	1
Storage Capacity								
Gross food storage (cu. ft.)	13.0	16.1	16.2	12.9	9.6	7.6	5.9	4.4
Net food storage (cu. ft.)	10.0	13.1	15.1	12.1	9.1	7.1	6.3	4.2
No. of shelves	4	5	7	8	4	4	3	3
Total shelf area (sq. ft.)	19.6	26.4	29.4	24.6	17.9	15.6	12.4	8.4
Ice Cube Trays								
No. of trays	6	6	8	6	6	6	3	3
No. of cubes produced	156	156	208	156	120	120	78	60
Weight of cubes (lbs.)	19½	19½	26	19½	15	15	9¾	7½
Thickness of Insulation (in.)								
Top	2½	2½	2½	2½	2	2	1¾	1¾
Sides	2½	2½	2½	2½	2	2	1¾	1½
Bottom	2½	2½	2½	2½	2	2	2	1¾
Compressor Specifications								
Compressor capacity I.M.E. (lbs.)	245	245	245	188	188	150	150	128
Motor size (hp.)	1/3	1/3	1/3	1/4	1/4	1/5	1/5	1/6
Compressor speed (r.p.m.)	575	575	575	440	440	350	350	300
Compressor bore (in.)	1½	1½	1½	1½	1½	1½	1½	1½
Compressor stroke (in.)	1-7/16							
No. of cylinders	2	2	2	2	2	2	2	2
Refrigerant in system (lbs.)	3½	3½	3½	3¼	2⅞	2¾	2⅝	2⅛
Weight net lbs.	576	652	602	544	433	421	370	294
Price (without freight)	$420	$509	$452	$362	$290	$261	$234	$185

Model No.	Master 434	Master 634	Master 834	Standard 634	Standard 534	Standard 434
Cabinet Specifications						
Overall Dimensions (in.)						
Height	55	59¾	62½	55⅜	52¾	50
Width	23¾	26⅛	29¾	26⅛	24⅞	23⅞
Depth	21⅛	23	24⅞	24½	24½	22¾
Inside dimensions of liner (in.)						
Height	27½	32¼	34½	32¼	29⅝	27½
Width	19⅛	21½	25	21½	20¼	19¼
Depth	14⅛	15⅞	17⅜	16	15⅞	14⅛
No. of doors	1	1	1	1	1	1
Storage Capacity						
Gross food storage (cu. ft.)	4.3	6.4	8.8	6.4	5.6	4.3
Net food storage (cu. ft.)	4.1	6.1	8.1	6.1	5.2	4.1
No. of shelves	3	4	4	4	3	3
Total shelf area (sq. ft.)	8.4	13.0	16.7	13.4	10.4	8.4
Ice Cube Trays						
No. of trays	3	3	6	3	3	2
No. of cubes produced	60	68	120	62	62	44
Weight of cubes (lbs.)	7½	8½	15	6	6	4
Thickness of Insulation (in.)						
Top	2	2	2	2	2	2
Sides	2	2	2	2	2	2
Bottom	2	2	2	2	2	2
Compressor Specifications						
Compressor capacity I.M.E. (lbs.)	128	150	188	...	...	...
Motor size (hp.)	1/6	1/5	1/4	1/16	1/16	1/20
Compressor speed (r.p.m.)	300	350	440	1700	1700	1700
Compressor bore (in.)	1½	1½	1½	...	...	...
Compressor stroke (in.)	1-7/16			...	...	...
No. of cylinders	2	2	2	...	...	...
Refrigerant in system (lbs.)	2⅛	2⅛	2⅝	1⅛	1⅛	⅞
Weight net lbs.	270	360	461	218	205	185
Price (without freight)	$145	$203	$237	$155.50	$129.50	$99.50

* * *

Cabinet Materials
Make of cabinet: Frigidaire
Material used for frame: Super & Deluxe series—wood & steel; Standard & Master series—steel
Finish of shelves: Tinned
Material for breaker strip: Composition
Material used for gasket: Rubber
Make of insulation: Special Frigidaire

Finish
Cabinet finish (exterior): Super & Deluxe series—porcelain; others—Dulux
Cabinet finish (interior): Porcelain

Evaporator
Make of evaporator: Frigidaire
Evaporator construction: Plate type
Metal used: Brass
Type of refrigerant control: Super, Deluxe & Master, series—high side float; Standard series—restrictor
Type of ice trays: Aluminum

Compressor
Make of compressor: Frigidaire
Type of system: Super, Deluxe, & Master series—conventional; Standard series—sealed
Type of compressor: Super, Deluxe, & Master series—reciprocating; Standard series—rotary

Special Features
Hydrator; rubber ice cube tray; rubber grid tray; automatic tray release; Servashelf; adjustable shelves; utility basket; automatic defrosting. In addition Deluxe series has water cooler, refrigerated rolling pin, frozen storage chest, serverette.

Policy
Guarantee on cabinet: 1 year
Guarantee on system: 1 year
Serviced by: Dealer
Compressor drive: Super, Deluxe, & Master series—belt; Standard—direct
Type of shaft seal: Bellows with Durex
Location of compressor: Below

Refrigerant
Refrigerant used: Super, Deluxe, & Master series—sulphur dioxide; Standard series—dichlorotetrofluoroethane ($C_2Cl_2F_4$)

Control
Make of control: Frigidaire
Type of control: Temperature
Temperature regulation method: Manual

Condenser
Make of condenser: Frigidaire
Method of cooling: Super, Deluxe, & Master series—two fans; Standard series—natural draft
Type of condenser: Super, Deluxe, & Master series—finned tube; Standard series—plate

Hardware
Make of hardware: Ternstedt
Process of manufacture: Die cast
Basic metal of hardware: Zinc
Finish of hardware: Chromium

Motor
Make of motor: Delco
Type of motor: Super, Deluxe, & Master series—repulsion induction; Standard series—split phase

Grunow

General Household Utilities Co., 2638 N. Crawford Ave., Chicago, Ill.

Model No.	65-SD	80-SD	54-D	65-D	80-D
Cabinet Specifications					
Overall dimensions (in.)					
Height	58⅜	62¼	56⅝	58⅜	62¼
Width	29⅜	31¼	24½	29⅜	31¼
Depth	25¾	25¾	25¾	25¾	25¾
Inside dimensions of liner (in.)					
Height	32⅛	36	31¼	32⅛	36
Width	23	25	19¼	23	25
Depth	16¾	16¾	17¼	16¾	16¾
No. of doors	1	1	1	1	1
Storage Capacity					
Gross food storage (cu. ft.)	7.18	8.73	6.01	7.18	8.73
Net food storage (cu. ft.)	6.5	8.0	5.4	6.5	8.0
No. of shelves	5	5	3	5	5
Total shelf area (sq. ft.)	13.96	15.54	10.34	13.96	15.54
Ice Cube Trays					
No. of trays	5	6	2	3	4
No. of cubes produced	87	108	63	84	105
Compressor Specifications					
Compressor capacity (lbs. 24 hours 14° F.)	136	136	136	136	136
Motor size (hp.)	1/5	1/5	1/5	1/5	1/5

* * *

Cabinet Materials
Make of cabinet: General Household Utilities
Material used for frame: Steel

Finish
Cabinet finish (exterior): Dulux
Cabinet finish (interior): Porcelain

Evaporator
Evaporator construction: "U" type with double headers
Type of refrigerant control: High side float

Refrigerant
Refrigerant used: Carrene
Chemical formula: CH_2Cl_2

Condenser
Make of condenser: Heat Transfer Corp.
Method of cooling: Fan
Type of condenser: Finned tube

Motor
Type of motor: Capacitor

Compressor
Make of compressor: General Household Utilities Co.
Type of system: Conventional
Type of compressor: Rotary
Compressor drive: Direct
Location of compressor: Below

Control
Make of control: Cutler Hammer
Type of control: Temperature
Temperature regulation method: Manual
How defrosted: Semi-automatic on models 65-SD & 80-SD; others—shut down unit

Special Features
All models—interior electric light; models 65-SD and 80-SD—door pedal and rapid freeze position on control.

Policy
Guarantee on cabinet: 1 year
Guarantee on system: 1 year
Serviced by: Dealer

HOW CHANGES
IN REFRIGERATION REQUIREMENTS
Demand FEDDERS
HIGH EFFICIENCY
LOW SIDES

NRA WE DO OUR PART

Forcedraft (Blower) Cooling! Individual Shelf Evaporators for Show Cases! Air Conditioning! Beer Cooling! Ice Cube Making! Non-Frost Evaporators, also for Ammonia Systems! Refrigerating Motor Trucks! Thermostatic and Automatic Expansion Valves! Name today's exacting requirements and you immediately think of FEDDERS REFRIGERATING APPLIANCES to do the job!

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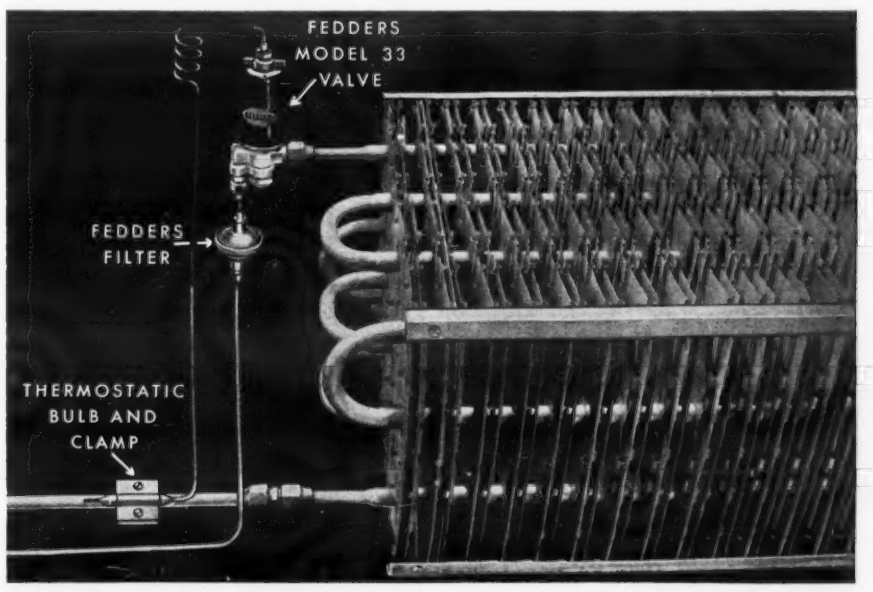
FEDDERS offers a complete line of BEER COOLING EQUIPMENT with and without Cabinets. Patent 1907641



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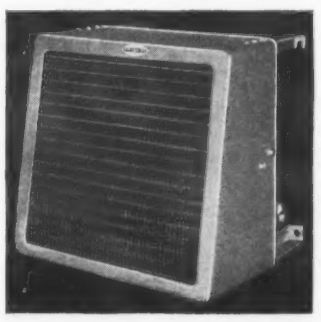

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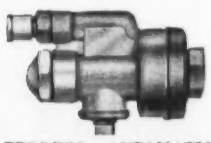

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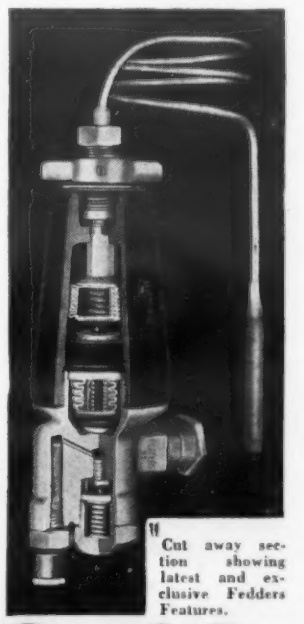

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ARE YOU GETTING YOUR COPY OF THE "FEDDERS NEWS"

Sanitary

Sanitary Electric Corp., Fond du Lac, Wis.

Model No.	41	45	68	75	98	120
Cabinet Specifications						
Overall dimensions (in.)						
Height	52½	51¾	56⅛	59⅛	59⅛	63⅝
Width	23	24⅝	29	29	36	40⅜
Depth	23½	22	26	26	26	26
Inside dimensions of liner (in.)						
Height	23½	28	30	33	33	35½
Width	17⅜	19¼	22⅝	22⅝	29⅝	34
Depth	16¾	14½	17¼	17¼	17¼	17¼
No. of doors	1	1	1	1	2	2
Storage Capacity						
Gross food storage capacity (cu. ft.)	4.1	4.5	6.9	7.6	9.9	12.2
Net food storage (cu. ft.)	3.40	4.16	6.34	6.96	9.15	10.80
No. of shelves	3	3	5	5	7	8
Total shelf area (sq. ft.)	7.0	8.4	14.5	14.5	19.4	23.1
Ice Cube Trays						
No. of trays	2	2	3	4	4	4
No. of cubes produced	42	56	84	112	112	84
Weight of cubes (lbs.)	3	4	6	8	8	11⅛
Thickness of Insulation						
Top (in.)	2½	2½	3	3	3	3
Sides (in.)	2½	2½	3	3	3	3
Bottom (in.)	2½	2½	3	3	3	3
Compressor Specifications						
Compressor capacity (lbs.) I.M.E.	92	92	92	92	92	192
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	¼
Standard speed (r.p.m.)	530	530	530	530	530	440
Compressor bore (in.)	1½	1½	1½	1½	1½	1⅝
Compressor stroke (in.)	1½	1½	1½	1½	1½	1¾
Refrigerant in system (lbs.)	3	3¼	3¾	4	4	6
Lubricant in system (oz.)	8	8	8	8	8	16
Weight, net (lbs.)	275	255	320	360	365	460
Price, f.o.b. factory, including tax	..	$105	$146.60	$162.75	$192	$241.80

* * *

Cabinet Materials
Make of cabinet ..... Sanitary
Material used for frame ..... Wood
Finish of shelves ..... Tinned
Material used for breaker strip ..... Model 41—wood; others—composition
Material used for gasket ..... Rubber

Finish
Cabinet finish (exterior) ..... Lacquer
Cabinet finish (interior) ..... Porcelain

Hardware
Process of manufacture ..... Cast & stamped
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Evaporator
Evaporator construction ..... Models 41 & 120—tubular; others—shell
Metal used ..... Models 41 & 120—copper & brass; others—steel
Type of refrigerant control ..... Low side float

Condenser
Method of cooling ..... Fan
Type of condenser ..... Finned tube

Compressor
Type of system ..... Conventional
Type of compressor ..... Reciprocating
Compressor drive ..... Belt
Location of compressor ..... Below

Motor
Type of motor ..... Capacitor & repulsion-induction

Control
Type of control ..... Temperature
Temperature regulation method ..... Manual
How defrosted ..... Wide cycle defrosting mechanism

Refrigerant
Refrigerant used ..... Sulphur dioxide

Special Features
Interior electric light on all models but 41.

Policy
Guarantee on system ..... One year
Serviced by ..... Dealer or distributor
Are replacement parts furnished to independent service companies ..... Yes

Liberty

Liberty Refrigeration Corp., 241 Georgia Ave., Providence, R. I.

Model No.	D-4 L-4	P-5 D-5	P-6 D-6	D-75
Cabinet Specifications				
Overall dimensions (in.)				
Height	56⅞	60¼	63⅜	63⅜
Width	25⅜	26⅜	30½	34⅛
Depth	20⅝	22⅛	22⅛	23⅛
No. of doors	1	1	1	1
Storage Capacity				
Gross food storage (cu. ft.)	4.65	5.72	7.05	8.32
Net food storage (cu. ft.)	4.10	5.10	6.20	7.50
Total shelf area (sq. ft.)	8.95	12.45	12.85	15.15
Ice Cube Trays				
No. of cubes produced	56	84	84	112
Weight of cubes (lbs.)	3½	5¼	5¼	7
Thickness of Insulation (in.)				
Top	2	2½	3	3
Sides	2	2½	3	3
Weight (lbs.)				
L & P models	290	368	385	...
D models	296	349	374	406
Price, retail				
L & P models	$108	$191	$222	...
D models	$125	$172	$196	$236

Cabinet Materials
Finish of shelves ..... Tinned
Make of insulation ..... Multicel

Finish
Cabinet finish (exterior) ..... L models—lacquer; D models—Dulux; P models—porcelain
Cabinet finish (interior) ..... Porcelain

Hardware
Finish of hardware ..... Chromium

Compressor
Make of compressor ..... Liberty
Type of compressor ..... Reciprocating
Location of compressor ..... Below

Refrigerant
Refrigerant used ..... Methyl chloride

Control
Type of control ..... Temperature
How defrosted ..... Semi-automatic

Special Features
Electric light, foot pedal door opener, styled cabinet, removable shelves.

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... 1 year

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Major

Major Appliance Corp., 14th floor, Merchandise Mart, Chicago, Ill.

Model No.	L432	L526	P526	L628	P628	P856
Cabinet Specifications						
Overall dimensions (in.)						
Height	50⅞	53⅞	53⅞	56	56	56
Width	25½	26½	26½	30¼	30¼	38¾
Depth	23⅛	24⅝	24⅝	25⅛	25⅛	25⅛
Inside dimensions of liner (in.)						
Height	27¼	29¾	29¾	31⅜	31⅜	31⅜
Width	19⅞	20⅜	20⅜	23⅝	23⅝	31⅞
Depth	15	16	16	15½	15½	15½
No. of doors	1	1	1	1	1	2
Storage Capacity						
Gross food storage (cu. ft.)	4.56	5.62	5.62	6.65	6.65	8.98
Net food storage (cu. ft.)	4.32	5.26	5.26	6.28	6.28	8.56
Total shelf area (sq. ft.)	9.27	10.49	10.49	12.77	12.77	16.57
No. of shelves	3	3	3	3½	3½	6
Ice Cube Trays						
No. of trays	2	2	2	3	3	4
No. of cubes produced	63	63	63	112	112	140
Weight of cubes (lbs.)	4¼	6	6	8	8	10
Thickness of Insulation (in.)						
Top	2	2½	2½	3	3	3
Bottom	2	2½	2½	3	3	3
Sides	2	2½	2½	3	3	3
Compressor Specifications						
Compressor capacity I.M.E. (lbs.) with a 20° evaporator and a 90° F. room	120	120	120	140	140	160
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	¼
Compressor speed (r.p.m.)	1725	1725	1725	1725	1725	1725
Compressor displacement (cu. ft. per hr. at atmospheric suction and 100 lbs. per sq. in. discharge pressure)	30	30	30	36	36	42
Weight, net, lbs.	115	130	130	138	138	145

* * *

Cabinet Materials
Make of cabinet ..... Seeger
Finish of shelves ..... Tinned
Material used for breaker strip ..... Panelyte
Material used for gasket ..... Rubber
Make of gasket ..... Miller
Make of insulation ..... Seeger "Multicell"

Finish
Cabinet finish (exterior) ..... L models—Dulux; P models—porcelain
Cabinet finish (interior) ..... Porcelain

Hardware
Process of manufacture ..... Cast
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Motor
Make of motor ..... General Electric
Type of motor ..... Capacitor

Compressor
Make of compressor ..... Sunbeam
Type of compressor ..... Four-vane rotary
Type of system ..... Conventional
Compressor drive ..... Direct
Type of shaft seal ..... Sunbeam
Location of compressor ..... Above

Refrigerant
Refrigerant used ..... Sulphur dioxide
Quantity in system (lbs.) ..... Model P856—2; models P628 & L628—1¾; all others—1½

Condenser
Make of condenser ..... McCord & Bush
Method of condenser cooling ..... Fan
Type of condenser ..... Finned tube

Lubrication
Make of lubricant ..... Argon white mineral oil
Quantity in system ..... 1 pint
How often should motor be oiled ..... Semi-annually

Control
Make of control ..... General Electric
Type of control ..... Temperature
Temperature regulation method ..... Manual
How defrosted ..... Wide cycle defrost mechanism, with automatic return to normal

Evaporator
Make of evaporator ..... Major
Evaporator construction ..... Shell
Metal used ..... Brass shell over copper tubing, tinned
Type of refrigerant control ..... High side float
Make of high side float ..... General Electric

Special Features
Interior electric light, ice tray release, "Tempostat" temperature indicator, double depth tray, and quick freeze position with automatic return on all models; sliding shelf and sliding fruit tray on all models except L-432.

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... 1 year; with additional guarantee to recondition afterward, up to five years, at a cost not to exceed $25
Are replacement parts sold to independent service companies ..... No

Apex

Apex Electrical Mfg. Co., 1070 E. 152nd St., Cleveland, Ohio

Model No.	SSL45* L410	L610	L600 P600	L800 P800	SSL6 DTL6	SSL7 DTL7	DTL8
Cabinet Specifications							
Overall dimensions (in.)							
Height	53½	58½	51½	57	55⅜	59⅞	64⅛
Width	24¾	27¾	28⅜	31⅝	33¼	33¼	33¼
Depth	23	25	26½	26½	25½	25½	25½
Inside dimensions of liner (in.)							
Height	25½	31	24	30	26¼	30½	34¾
Width	19¾	22	21¾	25	25¼	25¼	25¼
Depth	16	17½	18	18	18	18	18
No. of doors	1	1	1	1	1	1	1
Storage Capacity							
Gross food storage (cu. ft.)	4.6	6.9	5.6	7.8	6.9	8.0	9.1
Net food storage (cu. ft.)	4.0	6.2	4.8	7.0	6.1	7.1	8.1
No. of shelves	4	5	4	5	7	7	8
Total shelf area (sq. ft.)	7.5	12.2	9.1	13.7	13.0	13.0	15.9
Ice Cube Trays							
No. of trays	2	3	3	4	3	4	4
No. of cubes produced	56	84	84	112	84	112	112
Weight of cubes (lbs.)	3½	5¼	5¼	7	5¼	7	7
Thickness of Insulation (in.)							
Top	2	2¼	2½	2½	3	3	3
Sides	2	2¼	2½	2½	3	3	3
Bottom	2	2¼	2½	2½	3	3	3
Compressor Specifications							
Compressor capacity I.M.E. (lbs.)	80	95	95	110	95	110	160
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛	⅓
Compressor speed (r.p.m.)	410	460	460	520	460	520	410
Compressor bore (in.)	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜	1⅜
Compressor stroke (in.)	1½	1½	1½	1½	1½	1½	1½
No. of cylinders	1	1	1	1	1	1	2
Quantity of refrigerant in system (lbs.)	1½	1½	4½	5	4½	5	5½
Quantity of lubricant in system (oz.)	8	8	8	8	12	12	16
Weight net (lbs.), lacquer models	267	320	334	398	350	400	475
Weight, net (lbs.), porcelain models	...	...	382	448	...	...	...

*Specifications for SSL45 are practically the same as L410.

* * *

Cabinet Materials
Material used for frame ..... Steel & wood
Finish of shelves ..... Tinned
Material used for breaker strip ..... S & D models—Tylak; others—Panelyte
Material used for gasket ..... Rubber
Make of insulation ..... 600 & 800 models—Celotex; others—Balsam Wool

Finish
Cabinet finish (exterior) ..... P-600 & P-800—porcelain; others—lacquer
Cabinet finish (interior) ..... Porcelain

Hardware
Process of manufacture ..... Models L-610 & L-410—stamped; others—forged
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Compressor
Make of compressor ..... Apex
Type of system ..... Conventional
Type of compressor ..... Reciprocating
Compressor drive ..... V-belt
Type of shaft seal ..... Sylphon
Location of compressor ..... Below

Refrigerant
Refrigerant used ..... Sulphur dioxide

Motor
Make of motor ..... Apex
Type of motor ..... Capacitor

Control
Make of control ..... S & D models—General Electric; others—Penn
Type of control ..... Temperature
Temperature regulation method ..... Manual
How defrosted ..... Semi-automatic

Lubrication
Brand of compressor lubricant ..... Sun Oil No. 2
How often should motor be oiled ..... Annually

Evaporator
Make of evaporator ..... Mullins & Apex
Evaporator construction ..... Models L-610 & L-410—alcohol brine tank; others—shell
Metal used ..... Models L-610 & L-410—copper; others—steel
Make of expansion valve ..... Fisher on models L-610 & L-410
Type of refrigerant control ..... Low side float on all but L-610 & L-410
Type of ice cube trays ..... Aluminum

Condenser
Make of condenser ..... Bush & Long
Method of cooling ..... Fan
Type of condenser ..... Finned tube

Special Features
All but L-610 and L-410 have electric light. S and D models have foot pedal door opener.

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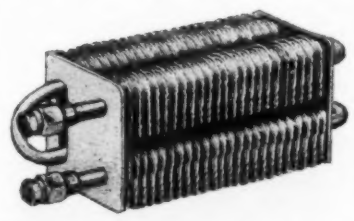

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The Acme Welded Pipe & Coil Co., Jackson, Mich.

Trukold

Montgomery Ward & Co., Chicago, Ill.

Model No.	MW 4	MW 650	MW 750
Cabinet Specifications			
Overall dimensions (in.)			
Height	50⅜	56½	57¼
Width	24½	28¼	31½
Depth	22⅛	23½	23½
Inside dimensions of liner (in.)			
Height	24⅛	29½	30¼
Width	19¾	22⅛	25¼
Depth	16¾	18⅜	18⅜
No. of doors	1	1	1
Storage Capacity			
Gross food storage (cu. ft.)	4.6	6.93	8.1
Net food storage (cu. ft.)	4.14	6.35	7.44
No. of shelves	3	4	6
Total shelf area (sq. ft.)	8.72	13.65	16.2
Ice Cube Trays			
No. of trays	3	3	4
No. of cubes produced	63	84	112
Weight of cubes (lbs.)	4	6½	9
Thickness of Insulation (in.)			
Top	2½	2½	2½
Sides	2½	2½	2½
Bottom	2½	2½	2½
Compressor Specifications			
Motor size (hp.)	⅛	⅛	⅛
Compressor bore (in.)	1½	1½	1½
Compressor stroke (in.)	1¼	1¼	1¼
No. of cylinders	1	2	2

Cabinet Materials
Make of cabinet ..... Leonard
Material used for frame ..... Wood
Finish of shelves ..... Tinned
Material used for breaker strip ..... Panelyte
Material used for gasket ..... Rubber

Finish
Cabinet finish (exterior) ..... Lacquer
Cabinet finish (interior) ..... Porcelain

Hardware
Make of hardware ..... Winters & Crampton
Process of manufacture ..... Cast
Basic metal of hardware ..... Steel
Finish of hardware ..... Chrome

Compressor
Make of compressor ..... Universal Cooler
Type of system ..... Conventional
Type of compressor ..... Reciprocating
Compressor drive ..... Belt
Type of shaft seal ..... Bellows
Location of compressor ..... Below

Refrigerant
Refrigerant used ..... Sulphur dioxide

Lubrication
Brand of compressor lubricant ..... White Star No. 150
How often should motor be oiled ..... Annually

Control
Make of control ..... Tagliabue
Type of control ..... Temperature
Temperature regulation method ..... Manual
How defrosted ..... Shut down unit

Motor
Make of motor ..... Delco
Type of motor ..... Capacitor-start

Evaporator
Make of evaporator ..... Mullins
Make of expansion valve ..... Detroit
Type of ice trays ..... Aluminum

Condenser
Method of cooling ..... Fan
Type of condenser ..... Fin tube

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Miller

Servel

Servel Sales, Inc., Evansville, Ind.

	CD 46	CD 51	CD 61	CD 71	CD 86
Model No.					
Cabinet Specifications					
Overall dimensions (in.)					
Height	50¾	52⅝	55	59	62¾
Width	24¾	24¾	25¾	27¾	35¼
Depth	24	24	24⅞	26⅛	26⅝
Inside dimensions of liner (in.)					
Height	26½	32	34	35⅝	35½
Width	19	18	19	20½	26
Depth	18	17	17¾	18	18½
No. of doors	1	1	1	1	1
Storage Capacity					
Gross food storage (cu. ft.)	5.2	5.7	6.6	7.6	9.9
Net food storage (cu. ft.)	4.6	5.1	6.1	7.1	8.6
No. of shelves	4	5	5	5	5
Total shelf area (sq. ft.)	8.5	9.8	11.3	12.3	15.7
Ice Cube Trays					
No. of trays	2	2	3	3	3
No. of cubes produced	42	42	63	63	60
Weight of cubes (lbs.)	3.75	3.75	5.6	5.6	6.5
Thickness of Insulation (in.)					
Top	2	2½	2½	3	3
Side	2	2½	2½	3	3
Bottom	2	2½	2½	3	3
Compressor Specifications					
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	550	550	550	550	550
Compressor bore (in.)	1⅜	1⅜	1⅜	1⅜	1⅜
Compressor stroke (in.)	1⅛	1⅛	1⅛	1⅛	1⅛
No. of cylinders	1	1	1	1	1
Price, installed, less freight	$129	157.50	168	178.50	204.75
Weight, net (lbs.)	285	310	325	375	455

* * *

Cabinet Materials
Make of cabinet ..... Servel
Material used for frame ..... Wood
Finish of shelves ..... Tinned
Materials used for breaker strip .... Maple-wood
Material used for gasket ..... Rubber
Make of gasket ..... Miller
Make of insulation ..... Temlok

Finish
Cabinet finish (exterior) ..... Pyroxylin lacquer
Cabinet finish (interior) ..... Porcelain

Compressor
Make of compressor ..... Servel
Type of system ..... Conventional
Type of compressor ..... Reciprocating
Compressor drive ..... Belt
Type of shaft seal ..... Bellows
Location of compressor ..... Below

Lubrication
Brand of compressor lubricant ..... Argon
Quantity in system ..... 1 pt.
How often should motor be oiled ..... Annually

Hardware
Make of hardware .... Keeler Brass and National Lock
Process of manufacture .... Forged and stamped
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Control
Make of control ..... Cutler-Hammer
Type of control ..... Temperature
Temperature regulation method .... Manual
How defrosted ..... Shut down unit

Evaporator
Make of evaporator ..... Servel
Evaporator construction ..... Shell
Metal used ..... Steel
Type of refrigerant control .... Expansion valve
Make of expansion valve ..... Detroit Lubricator
Type of ice cube trays ..... Aluminum

Motor
Make of motor ..... Wagner
Type of motor ..... Repulsion

Refrigerant
Refrigerant used ..... Methyl chloride
Amount in system ..... 2.3 lbs.

Condenser
Make of condenser ..... Fedders
Method of cooling ..... Fan
Type of condenser ..... Finned tube

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... 1 year
Serviced by ..... Distributor or dealer
Are replacement parts sold to independent service companies ..... No

Stewart-Warner

Stewart-Warner Corp., 1826 Diversey Parkway, Chicago, Ill.

	Standard 454	Standard 544	Standard 704	Deluxe 564A 564AP	Deluxe 714A 714AP	Deluxe 834A 834AP
Model No.						
Cabinet Specifications						
Overall dimensions (in.)						
Height	55¾	60¼	61¼	58¼	59¼	62½
Width	23¼	25¾	30	25¾	30	31½
Depth	24¾	25¼	27⅛	23⅝	25½	25¼
Inside dimensions of liner (in.)						
Height	27⅜	30⅞	31⅜	30⅞	31⅜	34⅝
Width	19	20½	23¾	20½	23¾	25¼
Depth	16¾	16⅞	17½	16⅞	17½	17¼
No. of doors	1	1	1	1	1	1
Storage Capacity						
Gross food storage capacity (cu. ft.)	5.1	6.2	7.5	6.2	7.5	8.7
Net food storage capacity (cu. ft.) (Nema rating)	4.6	5.6	7.1	5.6	7.1	8.3
Number of shelves	3	3	3½	3½	3½	4½
Total shelf area (sq. ft.) (Nema rating)	9.3	10.5	13.4	11.3	13.4	17.1
Ice Cube Trays						
No. of trays	2	3	3	5	5	6
No. of cubes produced	56	84	84	77	77	105
Weight of cubes (lbs. total)	4¼	6⅜	6⅜	5½	5½	7⅜
Thickness of Insulation (in.)						
Top	2	3	3	3	3	3
Sides	2	2½	3	2½	3	3
Door	2¾	3	3½	3	3½	3½
Compressor Specifications						
Compressor capacity (lbs.) I.M.E. (5° F-86° F.)	155	155	155	155	155	155
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛
Compressor speed r.p.m.	375	375	375	375	375	375
Prices (f.o.b. factory)						
Lacquer models (A)	129.50	169.50	197.50	219.50	244.50	264.50
Porcelain models (AP)	....	....	....	244.50	269.50	295.50

* * *

Cabinet Materials
Make of cabinet ..... Rex
Material used for frame ..... Steel
Finish of shelves ..... Hot tinned
Materials used for breaker strip ..... Tylac
Material used for gasket ..... Rubber
Make of gasket ..... Miller
Make of insulation ..... Balsam Wool

Finish
Cabinet finish (exterior) ..... Lacquer or porcelain
Cabinet finish (interior) ..... Porcelain

Evaporator
Make of evaporator ..... Mullins
Evaporator construction ..... Pressed steel shell, porcelain
Metal used ..... Steel
Type of refrigerant control .. Low-side float

Hardware
Make of hardware .... Winters & Crampton
Process of manufacture ..... Cast
Metal of hardware ..... White brass
Finish of hardware ..... Chromium

Condenser
Make of condenser ..... McCord
Method of cooling ..... Air cooled by motor fan
Type of condenser ..... Finned tube

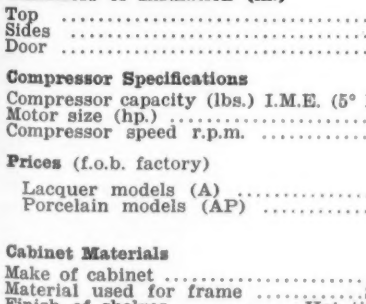
Control
Make of control ..... Penn
Type of control ..... Temperature
Temperature regulation method .... Manual
How defrosted ..... Wide cycle on Standard and semi-automatic on Deluxe
Type of ice cube trays ... Anodic aluminum and Flexo

Compressor
Make of compressor ..... Stewart-Warner
Type of system ..... Flooded
Type of compressor ..... Reciprocating twin cylinder
Compressor drive ..... Belt
Make of shaft seal ..... Fulton
Location of compressor ..... Below

Refrigerant
Refrigerant used ..... Sulphur dioxide
Chemical formula ..... SO_2
Quantity in system ..... 5 lbs.

Motor
Make of motor ..... General Electric
Type of motor ..... Capacitor start

Lubrication
Quantity in system ..... 22 oz. 80 to 90 vis. white oil
How often does system require lubrication ..... Never
How often does motor require lubrication ..... Once a year



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Copeland

Copeland Refrigeration Corp., 332 Cass Ave., Mt. Clemens, Mich.

	454	L604	P604	L704	P704	L854	P854
Model No.							
Cabinet Specifications							
Overall dimensions (in.)							
Height	55½	61¼	61¼	63⅛	63⅛	64¼	64¼
Width	24	26	26	31⅞	31⅞	35¾	35¾
Depth	20⅛	21⅛	21⅛	23⅛	23⅛	24⅛	24⅛
Inside dimensions of liner (in.)							
Height	26	31	31	30⅞	30⅞	30⅞	30⅞
Width	20¼	20⅞	20⅞	24¼	24¼	27¼	27¼
Depth	14⅞	15¼	15¼	16¼	16¼	17⅛	17⅛
Storage Capacity							
Gross food storage (cu. ft.)	4.42	5.81	5.81	6.95	6.95	8.46	8.46
Net food storage (cu. ft.)	3.96	5.25	5.25	6.41	6.41	7.42	7.42
No. of shelves	4	4	4	4	4	4	4
Total shelf area (sq. ft.)	8.3	9.0	9.0	10.8	10.8	14.1	14.1
Ice Cube Trays							
No. of trays	2	3	3	3	3	3	3
No. of ice cubes produced	77	105	105	105	105	108	108
Weight of ice cubes (lbs.)	5	6½	6½	6½	6½	6½	6½
Thickness of Insulation (in.)							
Top	2	2½	2½	3½	3½	4	4
Sides	2	2½	2½	3½	3½	4	4
Bottom	2	2½	2½	3½	3½	4	4
Compressor Specifications							
Capacity (lbs.) I.M.E.	100	100	100	100	100	150	150
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	360	360	360	360	360	360	360
Compressor bore (in.)	1½	1½	1½	1½	1½	2	2
Compressor stroke (in.)	1½	1½	1½	1½	1½	1½	1½
No. of cylinders	1	1	1	1	1	1	1

* * *

Cabinet Materials
Make of cabinet ..... Truscon & Lima Sheet Metal
Material used for frame ..... Steel & wood
Finish of shelves ..... Tinned
Material used for breaker strip ... Wood & rubber
Material used for gasket .... Molded rubber
Make of insulation ..... Balsam Wool

Finish
Cabinet finish (exterior) ..... Model 454 & "L" models—lacquer; others—porcelain
Cabinet finish (interior) ..... Porcelain

Hardware
Process of manufacture ..... Forgings & stampings
Basic metal of hardware ..... Brass
Finish of hardware ..... Chromium

Compressor
Make of compressor ..... Copeland
Type of system ..... Conventional
Type of compressor ..... Reciprocating
Compressor drive ..... Belt
Type of shaft seal ..... Bellows
Location of compressor ..... Below

Refrigerant
Refrigerant used ..... Methyl chloride
Amount in system ..... 1 lb.

Motor
Make of motor ..... Delco

Lubrication
Brand of compressor lubricant .. Shell No. 3
Quantity in system ..... ⅝ pts.
How often should motor be oiled ... Every 6 months

Control
Make of control ..... Penn
Type of control ..... Temperature
Temperature regulation method ..... Manual
How defrosted ..... Defrost position on control

Evaporator
Make of evaporator ..... Copeland
Evaporator construction ..... Tubing over sleeve on all but models L-854 & P-854 which have brine tank
Make of expansion valve ..... Detroit Lubricator
Type of ice trays ..... Aluminum rubber tray in all models except 454

Condenser
Make of condenser ..... Bush
Method of cooling ..... Fan
Type of condenser ..... Finned tube

Policy
Guarantee on cabinet ..... 1 year
Guarantee on system ..... 1 year
Are replacement parts furnished to independent service companies ..... No

The IDEAL Refrigerant

- Non-Corrosive
- Economical
- Efficient
- Steady Temperature Control
- Low Acid and Moisture
- Easy to Service

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AGAIN

RANCO

THERMOSTATS LEAD THE FIELD

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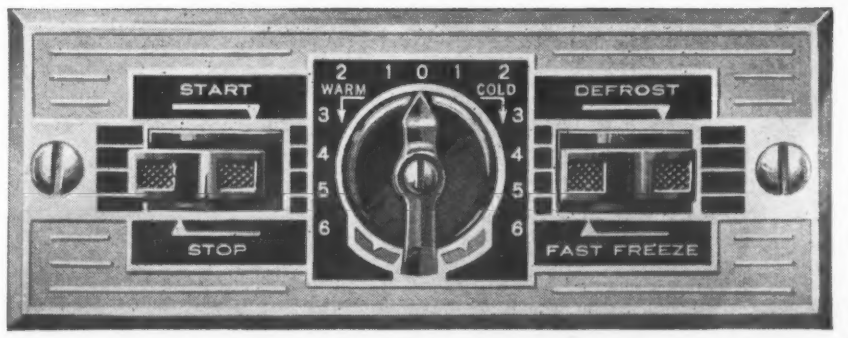
The new Model "FF" provides all features necessary to make your refrigerator **modern.**



Front view of "FF" horizontal thermostat complete with dial plate

●

Many outstanding and desirable features are listed, illustrated and described in a bulletin which will gladly be furnished on your request, by the manufacturer

THE AUTOMATIC RECLOSING CIRCUIT BREAKER CO.
1300-10 Indianola Avenue Columbus, Ohio, U.S.A.

Wurlitzer-Mohawk

Rudolph Wurlitzer Mfg. Co., North Tonawanda, N. Y.

Model No.	L-40	L-46	P-58 L-58	P-72 L-72	P-85
Cabinet Specifications					
Overall dimensions (in.)					
Height	52½	54¼	58⅜	64	64
Width	23	25⅞	29½	31¼	34¾
Depth	22½	23¾	25⅛	27⅛	27⅛
No. of doors	1	1	1	1	2
Storage Capacity					
Net food storage (cu. ft.)	4.0	4.6	5.8	7.2	8.5
No. of shelves	3	3	4	5	5
Total shelf area (sq. ft.)	7.4	9.0	11.0	14.0	16.0
Ice Cube Trays					
No. of trays	2	2	3	4	4
No. of cubes produced	36	56	84	112	112
Weight of cubes (lbs.)	2.7	4.2	6.3	8.4	8.4
Thickness of Insulation (in.)					
Top	1½	2	2½	3	3
Sides	1½	2	2½	3	3
Bottom	1½	2	2½	3	3
Compressor Specifications					
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	430	430	430	430	430
No. of cylinders	1	1	1	1	1

* * *

Cabinet Materials
Make of cabinet .....Wurlitzer
Material used for frame .....Wood
Finish of shelves .....Tinned
Material used for gasket .....Rubber
Make of insulation.....Temlok

Finish
Cabinet finish (exterior) ...P models—porcelain; L models—lacquer
Cabinet finish (interior) .....Porcelain

Compressor
Make of compressor.....Universal Cooler
Type of system.....Conventional
Type of compressor.....Reciprocating
Compressor drive .....V-belt
Type of shaft seal .....Bellows
Location of compressor .....Below

Refrigerant
Refrigerant used .....Methyl chloride
Amount in system .....1½ lbs.

Control
Type of control .....Thermostatic
Temperature regulation method....Manual
How defrosted.....Shut down unit

Motor
Make of motor .....Wagner & Howell
Type of motor.....Wagner—repulsion-induction; Howell—capacitor

Evaporator
Evaporator construction .....Tubular
Type of ice trays .....Aluminum

Condenser
Method of cooling .....Fan
Type of condenser .....Finned tube

Special Features
Electric light on all but model L-40.

Graybar Ilg-Kold

Ilg Electric Ventilating Co., 2850 N. Crawford Ave., Chicago, Ill.

Model No.	45-L	55-L	65-L	85-L	65-P	85-P
Cabinet Specifications						
Overall dimensions (in.)						
Height	53⅞	56¼	61	62	61	62
Width	24⅜	26⅜	30½	31¾	30½	31¾
Depth	22⅛	24¾	24⅞	27⅞	24⅞	27⅞
Inside dimensions of liner (in.)						
Height	26¾	29¼	32	33	32	33
Width	19⅜	20⅜	23½	34¾	23½	34¾
Depth	16	17	16	18⅞	16	18⅞
No. of doors	1	1	1	1	1	1
Storage Capacity						
Gross food storage (cu. ft.)	4.8	5.88	6.98	8.98	6.98	8.98
Net food storage (cu. ft.)	4.5	5.50	6.50	8.50	6.50	8.50
No. of shelves	5	5	6	6	6	6
Total shelf area (sq. ft.)	8.6	10.21	13.50	14.20	13.50	14.20
Ice Cube Trays						
No. of trays	2	3	3	4	3	4
No. of cubes produced	42	63	84	105	84	105
Weight of cubes (lbs.)	4	6	8	10	8	10
Thickness of Insulation (in.)						
Top	2	2	3	3	3	3
Side	2	2½	3	3	3	3
Bottom	2	2	3	3	3	3
Compressor Specifications						
Motor size (hp.)	1/6	1/6	1/6	1/6	1/6	1/6
Compressor speed r.p.m.	280	280	280	280	280	280
Compressor bore (in.)	1½	1½	1½	1½	1½	1½
No. of cylinders	1	1	1	1	1	1
Weight, net (lbs.)	250	275	305	325	358	400
Motor						
Make of motor	Ilg					
Type of motor	Capacitor					

Cabinet Materials
Make of cabinet .....Seeger
Materials used for frame....Steel & wood
Finish of shelves .....Tinned
Material for breaker strip....Composition
Material used for gasket.....Rubber

Finish
Cabinet finish (exterior).....L models—lacquer; P models—porcelain
Cabinet finish (interior) .....Porcelain

Hardware
Process of manufacture .....Cast
Basic metal of hardware .....Brass
Finish of hardware .....Chromium

Compressor
Make of compressor .....Ilg
Type of system .....Conventional
Type of compressor .....Reciprocating
Compressor drive .....V-belt
Type of shaft seal.....floating ground ring
Location of compressor .....Below

Refrigerant
Refrigerant used .....Isobutane
Amount in system .....10 oz.

Lubrication
Quantity in system ....1¼ pts.
How often should motor be oiled...Semi-annually

Control
Type of control .....Temperature
Temperature regulation method.Automatic
How defrosted .....Push-button switch

Evaporator
Make of evaporator .....Ilg
Evaporator construction .....Continuous tube in cast aluminum alloy
Metal used.....Copper & aluminum alloy
Type of refrigerant control.Expansion valve
Type of ice cube trays.....Aluminum

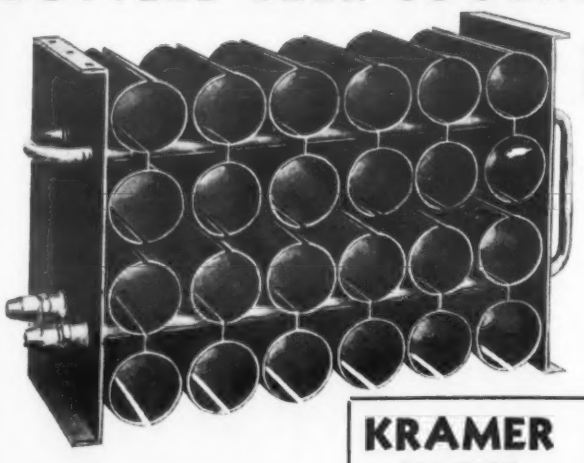
Condenser
Method of cooling .....Fan
Type of condenser.....Finned tube

Special Features
Electric light in porcelain models.

Policy
Guarantee on cabinet .....1 & 3 years
Guarantee on system .....1 & 3 years
Serviced by .....Dealer & distributor

BOTTLED BEER-COOLING COILS by Kramer deserve your investigation

Why not send for information NOW!



All copper and brass (hot tinned). Fit in almost any convenient space. Fit standard beer bottles. Made with capacities for any number of bottles. Cool bottles to just the right temperature without sweating or soaking off labels.

KRAMER ICE CUBE MAKER

In various sizes for various capacities

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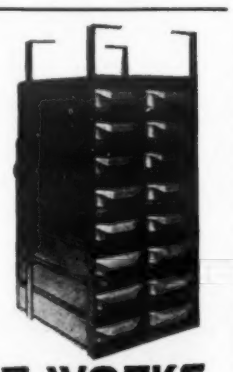

TRENTON AUTO RADIATOR WORKS

5145 Liberty Ave. Pittsburgh, Pa. — TRENTON, NEW JERSEY — 241 West 68th St. New York, N. Y.

Dayton

Dayton Refrigeration Corp. (Heinz & Munschauer), Buffalo, N. Y.

Model No.	4-A-2	5-B-2	6-B-3	7-B-4	8-B-4	283-P
Cabinet Specifications						
Overall dimensions (in.)						
Height	53	56	56	56	56	58
Width	23½	24½	28½	31⅞	35¼	33¼
Depth	20½	24½	24½	24½	24½	23¼
Inside dimensions of liner (in.)						
Height	26¼	29½	29½	29½	29½	30
Width	18	18½	22½	25⅞	29¼	26
Depth	15¼	17⅜	17⅜	17⅜	17⅜	17
No. of doors	1	1	1	1	2	2
Storage Capacity						
Gross food storage (cu. ft.)	4.32	5.45	6.65	7.70	8.70	7.54
Net food storage (cu. ft.)	4.0	5.02	6.03	7.04	8.04	7.05
No. of shelves	3	6	6	6	7	4
Total shelf area (sq. ft.)	6.5	10.53	12.83	15.075	15.83	12.8
Ice Cube Trays						
No. of trays	2	2	3	4	4	3
No. of cubes produced	56	56	84	112	112	84
Weight of cubes (lbs.)	5	5	7½	10	10	7½
Thickness of Insulation (in.)						
Top	2	3	3	3	3	3
Side	2	3	3	3	3	3
Bottom	2	3	3	3	3	3
Compressor Specifications						
Compressor capacity (lbs.) I.M.E.	85	85	85	85	85	85
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	800	800	800	800	800	800
Compressor bore (in.)	1⅛	1⅛	1⅛	1⅛	1⅛	1⅛
Compressor stroke (in.)	1¼	1¼	1¼	1¼	1¼	1¼
No. of cylinders	1	1	1	1	1	1
Weight, total shipping (lbs.)	268	327	341	375	390	390

* * *

Cabinet Materials
Make of cabinet .....Dayton
Material used for frame.....Wood & steel
Finish of shelves .....Tinned
Material used for breaker strip.....Model 4-A-2—Masonite; others—Bakelite
Material used for gasket.....Rubber
Make of gasket .....Miller
Make of insulation.....Model 4-A-2—Fibrocel; others—Dry-Zero

Finish
Cabinet finish (exterior)....Model 283-P—porcelain; others—lacqquer
Cabinet finish (interior).....Porcelain

Hardware
Make of hardware....Model 4-A-2—Grand Rapids Brass; others—Winters & Crampton
Process of manufacture.....Stamped
Basic metal of hardware.....Brass
Finish of hardware .....Chromium

Motor
Make of motor .....Leland
Type of motor.....Capacitor

Compressor
Make of compressor.....National Pumps
Type of system .....Conventional
Type of compressor.....Reciprocating
Compressor drive .....Belt
Location of compressor.....Below

Refrigerant
Refrigerant used .....Sulphur dioxide
Amount in system.....Models 6-B-3 & 283-P—4 lbs., 6 oz.; 7-B-4 & 8-B-4—5 lbs.; others—3 lbs., 6 oz.

Lubrication
Brand of compressor lubricant.....Suniso
Quantity in system.....½ pt.
How often should motor be oiled...Every 3 months

Control
Make of control .....Ranco
Type of control .....Temperature
Temperature regulation method....Manual
How defrosted.....Shut down unit or automatic

Evaporator
Make of evaporator.....Mullins
Evaporator construction .....Shell
Metal used ....Steel, finished in porcelain
Type of refrigerant control..Low side float
Type of ice cube trays.....Aluminum

Condenser
Make of condenser .....McCord
Method of cooling .....Fan
Type of condenser .....Finned tube

Policy
Guarantee on cabinet .....None
Guarantee on system.....1 year
Are replacement parts sold to independent service companies.....Yes

Mayflower

Trupar Mfg. Co., 140 Davis Ave., Dayton, Ohio

Model No.	HS-45	HS-6	HP-6 H-6	HP-7 H17
Cabinet Specifications				
Overall dimensions (in.)				
Height	53½	57½	58⅛	61⅝
Width	24	29	27⅜	27⅜
Depth	20½	23½	23⅞	23⅞
Inside dimensions of liner (in.)				
Height	27	31¾	30½	36
Width	19¼	21¼	21	21
Depth	16	17⅛	17	17
No. of doors	1	1	1	1
Storage Capacity				
Gross food storage (cu. ft.)	4.8	6.6	6.3	7.4
Net food storage (sq. ft.)	4.5	6.0	5.9	6.9
No. of shelves	4	5	4	5
Total shelf area (sq. ft.)	9	12	11½	14
Ice Cube Trays				
No. of trays	2	3	3	4
No. of cubes produced	56	84	84	112
Weight of cubes (lbs.)	4¾	7⅛	7⅛	9½
Thickness of Insulation (in.)				
Top	2⅜	3	3	3
Sides	2	3½	3	3
Bottom	2½	3½	3½	3½
Compressor Specifications				
Compressor capacity I.M.E. (lbs.)	90	90	100	125
Motor size (hp.)	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	415	415	260	310
Compressor bore (in.)	1⅜	1⅜	1⅜	1⅜
Compressor stroke (in.)	1¾	1¾	1¾	1¾
No. of cylinders	1	1	2	2
Weight, net (lbs.)				
Lacquer	260	360	370	440
Porcelain	...	...	410	480

Cabinet Materials
Make of cabinet .....Rex
Material used for frame.....Steel
Finish of shelves.....Tinned
Material used for breaker strip...Panelyte
Material used for gasket.....Rubber
Make of insulation.....Balsam Wool

Hardware
Process of manufacture.....Cast
Basic metal of hardware.....Brass
Finish of hardware .....Chromium

Finish
Cabinet finish (exterior).....HP models—porcelain; H & HS models—lacquer
Cabinet finish (interior).....Porcelain

Motor
Make of motor.....Master & Delco
Type of motor.....Repulsion-Induction

Compressor
Make of compressor.....Mayflower
Type of system .....Conventional
Type of compressor.....Reciprocating
Compressor drive .....Belt
Location of compressor .....Below

Lubrication
Brand compressor lubricant..Sunisco No. 3
Quantity in system..Models HS-45 & HS-6 485 c.c.; others—605 c.c.
How often should motor be oiled...Every 3 years

Refrigerant
Refrigerant used.....Sulphur dioxide
Amount in system.....H-7 & HP-7—5.5 lbs; others—4.5 lbs.

Control
Make of control...Ranco& Cutler-Hammer
Type of control .....Temperature
Temperature regulation method....Manual
How defrosted.....By turning control to "Defrosting" position

Evaporator
Make of evaporator .....Mullins
Evaporator construction .....Shell
Metal used.....Steel, finished in porcelain
Type of refrigerant control..Low side float
Type of ice cube trays.....Aluminum, one Flexotray in all but models HS-45 & HS-6

Condenser
Make of condenser .....McCord
Method of cooling.....Fan
Type of condenser.....Finned tube

Special Features
Sliding trays, electric light, vegetable pan in all models but HS-45 & HS-6.

Policy
Guarantee of cabinet .....1 year
Guarantee on system .....1 year
Serviced by.....Distributors, dealers
Are replacement parts sold to independent service companies.....Yes

G-E Used by Explorers In Honduras

BELIZE, British Honduras—A General Electric refrigerator is part of the equipment of the first expedition of the National Museum of Honduras for the preservation of foodstuffs, chilling of game meats and other foods, and preservation of serums, according to Captain R. Stuart Murray, leader of the expedition.

Chilrite

Narragansett Machine Co. Vale St., Pawtucket, R. I.

Model No.	LP4S	L4 P4	L5 P5	L6 P6
Cabinet Specifications				
Overall dimensions (in.)				
Height	51½	54	57½	59⅞
Width	25	24⅜	26⅜	30½
Depth	20½	20⅝	22⅛	23⅛
Inside dimensions of liner (in.)				
Height	26¼	27¼	30	32
Width	20	19½	20⅜	23⅝
Depth	15½	14½	15½	15⅞
No. of doors	1	1	1	1
Storage Capacity				
Gross food storage (cu. ft.)	4.7	4.4	5.4	6.6
Net food storage (cu. ft.)	4.0	3.7	4.3	5.4
No. of shelves	3	3	5	5
Total shelf area (sq. ft.)	5.4	6.6	8.7	10.3
Thickness of Insulation (in.)				
Top	2¼	3⅜	3½	4⅛
Sides	2⅛	2¼	2¼	3⅛
Bottom	2⅜	2⅛	2½	3
Compressor Specifications				
Motor size (hp.)	1/6	1/6	1/6	1/6
Refrigerant in systems (lbs.)	4½	4½	5	6
Ice Cube Trays				
No. of trays	2	2	3	3
No. of cubes produced	56	56	84	84
Weight of cubes (lbs.)	4	4	6	6

Cabinet Materials
Make of cabinet .....Seeger
Material used for frame.....Wood
Finish of shelves .....Tinned
Material used for breaker strip..Formica
Material used for gasket.....Rubber
Make of insulation..Insulite and Dry-Zero

Finish
Cabinet finish (exterior).....P models—porcelain; all others—lacquer
Cabinet finish (interior) .....Porcelain

Hardware
Process of manufacture..Cast and stamped
Basic metal of hardware.....Brass
Finish of hardware .....Chromium

Motor
Make of motor .....Century
Type of motor .....Capacitor

Compressor
Make of compressor .....Chilrite
Type of system .....Conventional
Type of compressor .....Rotary
Compressor drive .....Direct
Make of shaft seal .....Rotary seal
Location of compressor .....Below

Refrigerant
Refrigerant used .....Sulphur dioxide

Lubrication
Make of lubricant.....Kaydol Special
Quantity in system .....1 quart
Motor should be oiled.....Annually

Control
Make of control .....Ranco
Type of control .....Temperature
Temperature regulation method....Manual
How defrosted .....Shut down unit

Evaporator
Make of evaporator .....Mullins
Evaporator construction .....Shell
Metal used for evaporator .....Steel
Type of control.....Low side float
Type and make of trays.....Aluminum

Condenser
Make of condenser .....Bush
Fan or natural draft cooling .....Fan
Type of condenser .....Finned tube

Special Features
Vegetable tray.

Policy
Guarantee on cabinet .....1 year
Guarantee on system .....1 year
Serviced by....Dealer, distributor, factory
Are replacement parts sold to independent service companies .....Yes

New Metal Designed for Ice Cream Cabinets

LA SALLE, Ill.—Designed particularly for use on ice cream cabinets is a new metal material, ChromCopper, now being introduced by the Apollo Metal Works of this city.

The metal is made by electrical fusion of chromium and copper, according to Edwin F. Koenig of the Apollo company. Its copper content permits it to be drawn and worked around sharp angles, and it has the lustre of chromium.

Non-Ferrous Tubing—That's All

—and enough! Non-ferrous tubing is our specialty, our field—and a large one. We specialize because we know it pays—for specialization breeds skill—skill is the foundation of quality—quality is the heart of value—and value satisfies our customers. That is why Wolverine Dehydrated Refrigeration Tubing is worth specifying. WOLVERINE TUBE COMPANY, 1491 Central Ave., Detroit, Mich. Sales Offices in 29 cities. Warehouse Stocks at convenient points. Export Dept., H. M. Robins Co., 120 Madison Ave., Detroit.

WOLVERINE
Seamless Copper Tubing
For Refrigeration

Ice-O-Matic

Williams Oil-O-Matic Heating Corp., Bloomington, Ill.

Model No.	L-41	L-53	P-53	LT-53	PT-53	LT-64	PT-64	DT-72
Cabinet Specifications								
Overall dimensions (in.)								
Height	58⅛	60½	60½	60½	60½	62	62	60¾
Width	23⅞	26⅜	26⅜	26⅜	26⅜	29⅛	29⅛	35⅛
Depth	20	22	22	22	22	23¾	23¾	23⅞
Inside dimensions of liner (in.)								
Height	26¼	29½	29½	29½	29½	31	31	30
Width	19	20½	20½	20½	20½	22	22	28
Depth	15½	16¾	16¾	16¾	16¾	17¾	17¾	17¾
No. of doors	1	1	1	1	1	1	1	2
Storage Capacity								
Gross food storage (cu. ft.)	4.3	5.8	5.8	5.8	5.8	7.0	7.0	8.54
Net food storage (cu. ft.)	4.0	5.3	5.3	5.3	5.3	6.4	6.4	7.2
No. of shelves	4	5	5	5	5	5	5	5
Total shelf area (sq. ft.)	7.7	10.0	10.0	10.0	10.0	11.8	11.8	13.5
Ice Cube Trays								
No. of trays	3	4	4	4	4	4	4	4
No. of cubes produced	54	72	72	72	72	84	84	84
Weight of cubes (lbs.)	3.75	5.0	5.0	5.0	5.0	5.6	5.6	8.54
Thickness of Insulation (in.)								
Top	2½	3	3	3	3	3½	3½	3
Side	2½	2½	2½	2½	2½	3	3	3
Bottom	2½	3	3	3	3	3½	3½	3
Compressor Specifications								
Compressor capacity (lbs.) I.M.E.	90	90	90	155	155	155	155	155
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛	⅛	⅛
Compressor speed (r.p.m.)	300	300	300	300	300	300	300	300
Compressor bore (in.)	1-5/16							
Compressor stroke (in.)	1½					1-5/16		
Refrigerant in system (lbs.)	2	2	2	2½	2½	2½	2½	2½
No. of cylinders	1	1	1	2	2	2	2	2

* * *

Cabinet Materials
Material used for frame.....Wood
Finish of shelves.....Tinned
Materials used for breaker strip....Model L-41—wood; others—Bakelite
Material used for gasket.....Rubber
Make of insulation.....Dry-Zero

Finish
Cabinet finish (exterior)...L & LT models lacquer; others—porcelain
Cabinet finish (interior).....Porcelain

Hardware
Make of hardware ..Winters & Crampton
Process of manufacture ..Cast & stamped
Basic metal of hardware .....Brass
Finish of hardware.....Chromium

Motor
Make of motor.....Williams
Type of motor.....Capacitor

Compressor
Make of compressor .....Williams
Type of system.....Conventional
Type of compressor .....Reciprocating
Compressor drive.....Belt
Type of shaft seal.....Bellows
Location of compressor.....Below

Refrigerant
Refrigerant used .....Methyl chloride

Lubrication
Brand of compressor lubricant..Stanolind
Quantity in system.....1¼ pts.
How often should motor be oiled..... Semi-annually

Control
Make of control .....Penn
Type of control .....Temperature
Temperature regulation method...Manual
How defrosted .....Semi-automatic

Evaporator
Make of evaporator .....Fedders
Evaporator construction .....Tubular
Metal used .....Copper
Type of refrigerant control.....Low side float
Type of ice cube trays .....Aluminum

Condenser
Make of condenser .....Fedders
Method of cooling .....Fan
Type of condenser.....Finned tube

Special Features
Vegetable tray & finger-trip door opener on all models; electric light on all porcelain models.

Policy
Guarantee on cabinet.....1 year
Guarantee on system.....1 year
Serviced by .....Dealer, distributor
Are replacement parts sold to independent service companies .....No

M & E

Merchant & Evans Co., 2035 Washington Ave., Philadelphia, Pa.

Model No.	LE-4	D-406	P-507 D-507	P-607 D-607	P-803
Cabinet Specifications					
Overall dimensions (in.)					
Height	54	56⅛	60½	63⅜	63⅜
Width	24⅜	25⅜	26⅜	30½	34⅛
Depth	20⅝	20½	22	22	23
Inside dimensions of liner (in.)					
Height	27½	27½	30	32	32
Width	19½	19½	20½	23⅝	23¼
Depth	15	15	16	15½	16⅛
No. of doors	1	1	1	1	1
Storage Capacity					
Gross food storage (cu. ft.)	4.65	4.65	5.72	7.05	8.32
Net food storage (cu. ft.)	4.07	4.07	5.0	6.17	7.41
Total shelf area (sq. ft.)	8.95	8.95	12.45	12.85	15.15
Ice Cube Trays					
No. of trays	3	2	3	4	5
No. of cubes produced	45	56	84	112	140
Thickness of Insulation (in.)					
Top	2	2	2½	3	3
Sides	2	2	2½	3	3
Bottom	2	2	2½	3	3
Compressor Specifications					
Compressor capacity I.M.E. (lbs.)	70	70	100	100	100
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛
Price, installed	$117	128	169.75	201.50	...
Price, installed (porcelain models)	...	...	191.50	232.50	272.50

* * *

Cabinet Materials
Make of cabinet.....Seeger
Material used for breaker strip....Bakelite
Make of insulation.....Multicell

Finish
Cabinet finish (exterior).....Models P-507, P-607, & P-803—porcelain; model L-4—lacquer; others—Dulux
Cabinet finish (interior).....Porcelain

Hardware
Process of manufacture.....Stamped
Basic metal of hardware.....Brass
Finish of hardware.....Chromium

Motor
Make of motor.....Wagner
Type of motor.....Repulsion-induction

Compressor
Make of compressor.....Merchant & Evans
Type of system.....Conventional
Type of compressor.....Reciprocating
Compressor drive .....Belt
Type of shaft seal.....Diaphragm
Location of compressor.....Below

Refrigerant
Refrigerant used.....Sulphur dioxide

Lubrication
Brand of compressor lubricant.....Sun
How often should motor be oiled.Annually

Control
Type of control.....Temperature
Temperature regulation method....Manual

Evaporator
Make of evaporator.....Model LE-4—M & E; others—McCord
Metal used .....Copper
Make expansion valve...Detroit Lubricator and Mayson
Type of ice cube trays.....Aluminum

Condenser
Make of condenser.....M & E
Method of cooling.....Fan
Type of condenser.....Finned tube

Special Features
Electric light on all but models LE-4 and D-407.

Policy
Guarantee on cabinet.....1 year
Guarantee on system.....1 year
Serviced by.....Distributor
Are replacement parts sold to independent service companies.....Yes

M&E COMPRESSORS

REFRIGERATION PROGRESS

Summarized in Our Latest Catalog and Data Sheets

YOURS FOR THE ASKING! And essential to every service company and assembler. Illustrates and describes 47 capacities and types of compressors including air cooled, air and water cooled, and all water cooled. DOMESTIC AND COMMERCIAL. ⅛ to 3 H.P.

BARE COMPRESSORS FOR ALL USES

also Complete Household Line, 4 to 7 cu. ft. and Pressure Water Coolers

8th SUCCESSFUL YEAR

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MERCHANT & EVANS CO., Manufacturers

PHILADELPHIA, PA. Est. 1866 LANCASTER, PA.

Challenger & Lectrik Ice

Uniflow Mfg. Co., Erie, Pa.

Model No.	S-45	S-60	D-42 P-42	D-52 P-52	D-63 P-63	D-84 P-84	P-105
Cabinet Specifications							
Overall dimensions (in.)							
Height	53	56	56	59	59	59	59
Width	23½	26½	26	26	28½	32½	38½
Depth	22⅛	24	23	23	25	26	26
Inside dimensions of liner (in.)							
Height	27⅝	27½	24¾	29¼	29¼	29¼	29¼
Width	18¼	20½	18½	18½	21	25¼	31¼
Depth	14⅞	16¾	16½	16½	18	19	18¾
No. of doors	1	1	1	1	1	1	2
Storage Capacity							
Gross food storage (cu. ft.)	4.6	6.0	4.5	5.5	6.7	8.0	10.2
Net food storage (cu. ft.)	4.0	5.4	4.0	5.0	6.0	7.0	9.0
No. of shelves	4	5	3	4	4	4	4
Total shelf area (sq. ft.)	8.5	12.0	7.5	9.5	12.0	13.5	16.5
Ice Cube Trays							
No. of trays	3	4	2	2	3	4	5
No. of cubes produced	54	72	56	56	84	112	140
Weight of cubes (lbs.)	3¾	5	4	4	6	8	10
Thickness of Insulation (in.)							
Top	2½	2½	3	3	3	3	4
Side	2	2	3	3	3	3	3
Bottom	2½	2½	3	3	3	3	4
Compressor Specifications							
Compressor capacity (lbs.) I.M.E.	75	75	75	110	110	150	200
Motor size (hp.)	⅛	⅛	⅛	⅛	⅛	⅛	¼
Compressor speed (r.p.m.)	550	550	550	375	375	450	375
Compressor bore (in.)	1⅝	1⅝	1⅝	1⅝	1⅝	1⅝	1⅝
Compressor stroke (in.)	1	1	1	1¾	1¾	1¾	1⅝
No. of cylinders	1	1	1	1	1	1	2
Quantity of refrigerant in system (lbs.)	3¼	4	1¼	1¼	1¼	1½	3

* * *

Cabinet Materials
Make of cabinet.....S models—Erie Art Metal; D & P models—Niagara
Material used for frame.....Wood
Finish of shelves.....Tinned
Material used for breaker strip..S models —wood; others—Bakelite
Material used for gasket.....Rubber
Make of gasket.....S models—Goodrich; others—Miller & Continental
Make of insulation.....S models—Temlok; others—Dry-Zero

Finish
Cabinet finish (exterior).....P models—porcelain; others—lacquer
Cabinet finish (interior).....Porcelain

Hardware
Make of hardware.....S models—Winters & Crampton; others—Grand Rapids Brass
Process of manufacture....S & D models—stamped; others—cast
Basic metal of hardware.....Brass
Finish of hardware.....Chromium

Motor
Make of motor.....Delco
Type of motor.....Repulsion-induction & condenser

Compressor
Make of compressor .....Uniflow
Type of system .....Conventional
Type of compressor.....Reciprocating
Compressor drive .....Belt
Type of shaft seal.....Bellows
Location of compressor.....Below

Refrigerant
Refrigerant used.....Sulphur dioxide
Trade name .....Ansul

Lubrication
Brand of compressor lubricant.....White mineral oil
Quantity in system.....S, D-42, & P-42 models—250 grams; P-105—1,000 grams; others—750 grams
How often should motor be oiled....Semi-annually

Control
Make of control .....Ranco
Type of control.....Temperature
Temperature regulation method....Manual
How defrosted.....Semi-automatic

Evaporator
Make of evaporator.....D & P models—Uniflow; others—Fedders
Evaporator construction...Shell & tubular
Metal used .....Copper
Make of expansion valve.....Detroit
Type of refrigerant control....S models—low-side float; others—expansion valve
Type of ice cube trays.....Aluminum

Condenser
Make of condenser.....Fedders
Method of cooling .....Fan
Type of condenser.....Finned tube

Special Features
Electric light in all models; porcelain shelf knobs and chromium tray fronts in D and P models.

Policy
Guarantee on cabinet.....1 year
Guarantee on system.....1 year
Serviced by.....Dealer or distributor
Are replacement parts sold to independent service companies.....Yes

Caswell Dealers Hear 1934 G-E Plan

DETROIT—General Electric's plans for refrigeration merchandising this year were presented in dramatic form to some 200 Michigan dealers at a meeting held at the local headquarters of Caswell, Inc., Michigan distributor.

The new G-E products were presented by District Manager Fred Harvey, making his first appearance before the Caswell dealers, and E. H. Wiggs of the factory production department.

Other speakers on the program included Frank Buten, retail sales manager; H. H. Rodey, commercial sales manager; P. M. Martin, sales promotion manager; E. H. Cross, range sales manager; D. L. Prouty, range product manager, all of Caswell, Inc. Syd Caswell himself closed the meeting with a special plea for action and a promise of a big advertising drive.

Home to roost!

COMPLAINTS ABOUT CABINET INSULATION ALWAYS COME BACK TO THE MANUFACTURER

THE possible loss of good dealer connections certainly outweighs any argument for an inferior insulation that won't stand up in service. Insulate *your* cabinets with rigid Armstrong's Temlok and definitely end any chance of a Customer-to-Dealer-to-You "squawk."

Temlok is a rigid, durable fibreboard with a high resistance to moisture and efficient insulating value. It's light in weight, odorless, and strong. It can't settle or pack. For your convenience Temlok is supplied in factory-fabricated sets, ready for time-saving installation. Temlok-insulated refrigerators are easier to sell, since consumers know Armstrong as the maker of linoleum and other high quality products.

Every refrigerator manufacturer will find it worth while to investigate Temlok and to consult with Armstrong engineers about the installation of insulation. Just mail the coupon below to Armstrong Cork & Insulation Company, 917 Concord Street, Lancaster, Pennsylvania.

Armstrong's TEMLOK REFRIGERATOR INSULATION

ARMSTRONG CORK & INSULATION COMPANY
917 Concord St., Lancaster, Penna.

Please send me complete details regarding Armstrong's Temlok Refrigerator Insulation.

☐ Please send sample.

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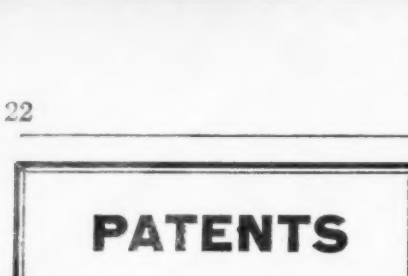
City.....State.....

PATENTS

Issued Feb. 27, 1934

1,949,157. ABSORPTION REFRIGERATING APPARATUS. Raymond Chester Fuller, Louisville, Ky., assignor to Henry Vogt Machine Co. Inc., Louisville, Ky., a corporation of Kentucky. Application Oct. 25, 1932. Serial No. 639,502. 7 Claims. (Cl. 62—119.)

1. Absorption refrigeration system including a generator having the construction of a tubular boiler, means for pumping strong refrigerant solution through the tubes, means for admitting steam to the boiler space surrounding said tubes for heating the refrigerant solution, and an analyzer with which said tubes communicate into which the heated strong solution passes, means for maintaining said



1,949,157

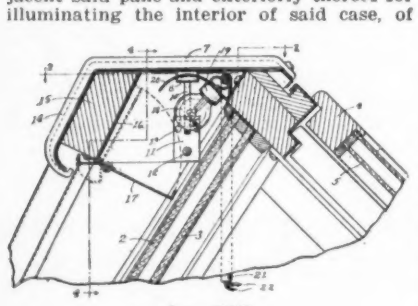
heated strong solution at a determined level, at an intermediate height in said analyzer, the latter providing a chamber above said liquid level for receiving the gaseous refrigerant boiled out from said strong solution within said analyzer.

1,949,179. PRODUCTION OF SOLID CARBON DIOXIDE. Raymond C. Pierce, Bronxville, N. Y., assignor to York Ice Machinery Corp., York, Pa., a corporation of Delaware. Application Sept. 15, 1930. Serial No. 482,105. 6 Claims. (Cl. 62—121.)

1. In an apparatus for the production of solid carbon dioxide, an expansion chamber having an expansion nozzle therein and an outlet therefrom; a flexible pervious member interposed between said nozzle and outlet for intercepting solidified carbon dioxide; and means for continuously shaking said member.

1,949,253. ILLUMINATED DISPLAY CASE. George J. Hopkins, Kendallville, Ind., assignor to McCray Refrigerator Co., Kendallville, Ind., a corporation of Indiana. Application June 2, 1933. Serial No. 674,076. 8 Claims. (Cl. 240—6.)

1. In a display case having a glass pane therein and lighting means disposed adjacent said pane and exteriorly thereof for illuminating the interior of said case, of



1,949,253

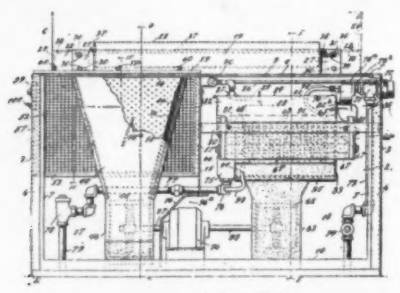
means for preventing visible reflection of said lighting means upon said pane comprising a canopy mounted upon said case and disposed over said lighting means, and a light shield pivotally connected adjacent the lower edge of said canopy and projecting laterally therefrom toward said pane and below said lighting means.

1,949,265. FREEZING APPARATUS. Emil Behringer, New York, N. Y. Application Dec. 31, 1930. Serial No. 505,930. 17 Claims. (Cl. 62—106.)

13. A refrigerating device comprising in combination opposed hollow headers, having spaced ends and flat hollow panels disposed between the ends of said headers and communicating interiorly with the latter to provide a refrigerating compartment therebetween, said hollows being adapted to accommodate a refrigerating agent.

1,949,379. VENTILATING AND AIR TREATING APPARATUS. Allston Sargent, Bronxville, N. Y., assignor to Campbell Metal Window Corp., New York, N. Y., a corporation of Maryland. Application May 10, 1932. Serial No. 610,351. 8 Claims. (Cl. 257—138.)

2. An apparatus of the character described comprising an enclosing casing to be located in a chamber to be ventilated, said casing containing a fresh air



1,949,379

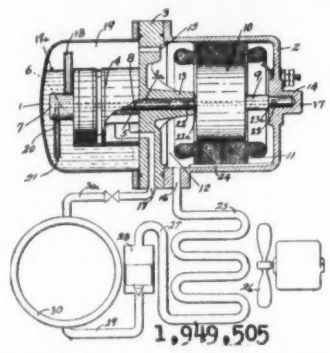
compartment, and an air-treating compartment, said fresh air compartment having air inlet means to receive fresh air from outside the chamber and having a fresh air outlet into the chamber, air-impelling means in said fresh air compartment to draw air in said inlet and including a delivery duct through which the fresh air is expelled through said outlet, means for filtering the air entering said fresh air compartment, sound absorbing surfaces in said compartment, said air-treating compartment having an air inlet and an air outlet to communicate with the chamber, air-treating means and air-impelling means in said last-named compartment, said impelling means operating to draw air from the chamber into the air-treating compartment to be treated therein, and return the treated air through said outlet to the chamber.

1,949,381. RAILWAY REFRIGERATOR CONTAINER. Lewis M. Showers, Jr., and Isaac M. Chambers, Juniata, Pa., assignors to The Pennsylvania Railroad Co., Philadelphia, Pa., a corporation of Pennsylvania. Application Oct. 10, 1932. Serial No. 636,980. 3 Claims. (Cl. 62—51.)

Issued Mar. 6, 1934

1,949,505. UNITARY MOTOR-COMPRESSOR. Joseph A. Warren, Mount Vernon, N. Y., assignor, by mesne assignments, to Frigidaire Corp., Dayton, Ohio, a corporation of Delaware. Application Aug. 19, 1929. Serial No. 386,779. 2 Claims. (Cl. 62—115.)

1. In combination, a pump having an inlet and an outlet, a body of lubricant for lubricating said pump, a motor connected thereto, a casing enclosing the



1,949,505

motor and being under the pressure of the outlet of said pump, an outlet from the casing, means for lubricating the motor bearings from said body of lubricant, said last named outlet being positioned to receive the drainage of excess lubricant from the casing and to remove it by the discharge pressure generated by the pump, means for relieving the pressure on said lubricant and means introducing it at the inlet of said pump.

1,949,518. REFRIGERATING SYSTEM. Lars H. Vold, Butler, Pa. Application Sept. 11, 1931. Serial No. 562,256. 6 Claims. (Cl. 62—9.15.)

1. A refrigerating system for frozen carbon dioxide comprising a plurality of evaporating chambers, and means for causing the carbon dioxide gas generated in one or more of said chambers to stimulate evaporation in other chambers.

1,949,522. HOUSEHOLD AIR COOLER. Jaye P. Williams, Colton, Calif. Application Aug. 5, 1931. Serial No. 555,169. 6 Claims. (Cl. 261—95.)

1. In an air humidifier and cooler, a housing provided in its upper portion with an air inlet opening and in its lower portion with an air outlet opening, a plurality of horizontally disposed porous blocks arranged in staggered relation within the housing between said openings said blocks having flat inclined side faces, means for delivering water into said blocks and means for producing and maintaining a flow of air downwardly through said housing and over the porous blocks therein.

1,949,540. AIR FILTER. James K. Hammond, Louisville, Ky., assignor to American Air Filter Co., Inc., Louisville, Ky., a corporation of Delaware. Application April 6, 1931. Serial No. 528,033. 3 Claims. (Cl. 183—63.)

1. In combination a filter medium in the form of an endless belt, a liquid bath arranged so that a portion of said belt extends into the bath, means for intermittently moving the belt, and means conditioned upon the movement of the belt for automatically agitating the liquid in the bath.

1,949,557. CONDENSER. Alvin H. Baer, Waynesboro, Pa., assignor to Frick Co., Waynesboro, Pa., a corporation of Pennsylvania. Application June 4, 1932. Serial No. 615,414. 3 Claims. (Cl. 257—39.)

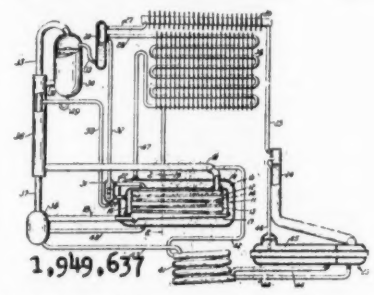
1. A condenser adapted to be positioned on a moving vehicle comprising a casing open at both ends, a fan mounted in one end of the casing, a motor for operating said fan, a plurality of condenser coils mounted in the other end of the casing, each set of coils being connected to upper and lower headers which headers lie substantially parallel with the direction of movement of the vehicle and each coil lying in a plane substantially at a right angle to the said headers, a baffle plate positioned between each coil and adjacent coil, said baffle plates being positioned at an angle to the plane of the coil for directing air through the coil, substantially as set forth.

1,949,616. FREEZING OUT OF WATER VAPORS CONTAINED IN COMPRESSED GASES OR GAS MIXTURES TO BE LIQUEFIED. Adolf Messer, Frankfort-on-the-Main, Germany. Application Dec. 7, 1932. Serial No. 646,085. In Germany Sept. 16, 1930. 8 Claims. (Cl. 62—122.)

1. An apparatus for separating one or more gas components from a gas mixture, which includes means for compressing the mixture, a heat exchange unit having an inlet and an outlet for said compressed mixture, an expansion valve at the outlet of said unit, means for removing moisture from the expanded air, means for returning the expanded mixture to said heat exchange units out of contact with freshly incoming compressed mixture but in heat exchange relationship therewith, a rectification column, pipe connections for delivering the compressed mixture from said heat exchange unit to said column, said connections having valves thereon whereby said column may be shut off from receiving compressed mixture from said unit until a predetermined temperature condition has been attained in said unit sufficient to condense substantially all the water vapors from the compressed mixture therein.

1,949,637. ABSORPTION REFRIGERATION APPARATUS. Robert S. Taylor, Evansville, Ind., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application April 22, 1933. Serial No. 667,349. 7 Claims. (Cl. 62—119.5.)

1. In an absorption refrigeration system of the pressure equalized type, a

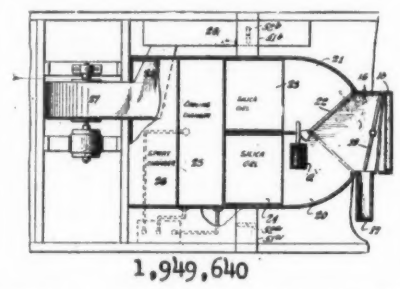


1,949,637

storage vessel for pressure equalizing gas connected in said system, and an absorber located within said vessel.

1,949,640. AIR CONDITIONING APPARATUS. Samuel M. Anderson, Sharon, Mass., assignor to B. F. Sturtevant Co., Hyde Park, Mass., a corporation of Massachusetts. Application March 25, 1932. Serial No. 601,155. 8 Claims. (Cl. 257—7.)

1. An air conditioning system comprising a dehydration chamber having duplicate beds of hygroscopic material, a cooling chamber, a spray chamber, a cooling tower for cooling water supplied to said spray and cooling chambers, means for



1,949,640

passing a current of air through said chambers, means for rendering one of said beds inactive when it has absorbed a given amount of moisture from the air, means for heating the dehydration material used in the inactive bed, and means for cooling the heated dehydration material in said inactive bed after it has given up its excess moisture content.

1,949,651. ABSORPTION REFRIGERATING SYSTEM. Guido Maiuri, London, England, assignor, by mesne assignments, to Electrolux Servel Corporation, New York, N. Y., a corporation of Delaware. Application Oct. 1, 1931. Serial No. 566,207. In Germany Jan. 5, 1931. 26 Claims. (Cl 62—119.5.)

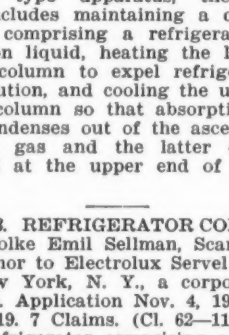
1. In the art of refrigerating with absorption type apparatus, the method which includes maintaining a column of solution comprising a refrigerant in an absorption liquid, heating the lower end of said column to expel refrigerant gas from solution, and cooling the upper part of said column so that absorption liquid vapor condenses out of the ascending refrigerant gas and the latter condenses to liquid at the upper end of said column.

1,949,663. REFRIGERATOR CONSTRUCTION. Folke Emil Sellman, Scarsdale, N. Y., assignor to Electrolux Servel Corporation, New York, N. Y., a corporation of Delaware. Application Nov. 4, 1930. Serial No. 493,319. 7 Claims. (Cl. 62—116.)

1. A refrigerator comprising a substantially L-shaped section on which is mounted refrigerating appartus including a cooling element, and a cabinet enclosing a refrigerating chamber, said cabinet being constructed to be assembled with and supported by said apparatus section to form a unitary structure therewith, and the cooling element being positioned in the refrigerating chamber when the cabinet is so assembled.

1,949,676. REFRIGERATING APPARATUS. Robert R. Candor and Duward C. Staley, Dayton, Ohio, assignors to Frigidaire Corp., Dayton, Ohio, a corportion of Delaware. Application Oct. 31, 1930. Serial No. 492,432. 18 Claims. (Cl. 62—8.)

1. A flooded type cooling unit including a supply reservoir, a cooling member adapted to contain liquid refrigerant, and a second reservoir, conduits connecting the supply reservoir, the cooling member



1,949,676

of the second reservoir, and a thermostatically controlled valve in the conduit connecting the supply reservoir and the cooling member for controlling the accumulation of gaseous refrigerant in the cooling member for varying the cooling action of the cooling member, by forcing liquid refrigerant into the second reservoir.

1,949,724. REFRIGERATOR CIRCUIT BREAKER. Carl E. L. Lipman, Chicago, Ill., assignor to Lipman Patents Corp., Chicago, Ill., a corporation of Delaware. Application June 29, 1931. Serial No. 547,517. 4 Claims. (Cl. 62—4.)

1. The combination with an electrically driven hermetically sealed refrigerating unit comprising a motor compressor unit enclosed by a sealed casing into which the compressor discharges gaseous refrigerant, of a fusible conductive element disposed exterior of the casing and in heat conductive relation thereto, said fusible element being connected in and bridging a gap in the supply circuit to said motor, and being arranged to fall by gravity upon fusion to open the gap and interrupt the motor circuit to prevent undue rise of temperature in the casing and consequent expansion of gaseous refrigerant therein.

1,949,730. APPARATUS FOR THE MANUFACTURE OF A REFRIGERANT. Mark Shoeld, Mount Lebanon Township, Allegheny County, Pa., assignor to The Koppers Co. of Delaware, a corporation of Delaware. Application Aug. 28, 1929. Serial No. 388,933. 1 Claim. (Cl. 62—121.)

Apparatus comprising a chamber having a perforated wall, a tube extending from the bottom of the said chamber; a plurality of spaces solid walls encasing the sides of said chamber and of the said tube and forming continuous annular chambers around both; inlet means at the top of the said first named chamber for compressed, cooled gas containing carbon dioxide; scrapers for removing carbon dioxide snow from the said perforated wall; gas outlet means for withdrawing gas through the perforated wall and the innermost annular chamber; and a screw conveyer for passing the carbon dioxide snow from the bottom of the said first named chamber through the said tube.

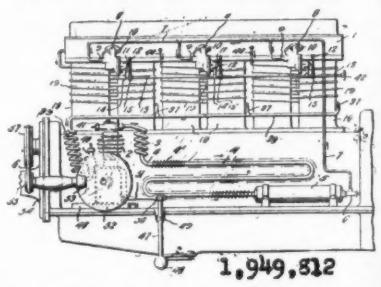
1,949,732. VACUUM INSULATION. Lyman F. Whitney, Boston, Mass., assignor to Comstock & Westcott, Inc., Boston, Mass., a corporation of Massachusetts. Application Dec. 17, 1930. Serial No. 503,005. 7 Claims. (Cl. 62—115.)

4. Method of concomitantly maintaining a vacuum in the hollow housing of a refrigerator and producing refrigeration at low pressure comprising the circulation of a primary fluid by its evaporation entraining a stream of refrigerant from a body of liquid refrigerant within the refrigerator in the vaporized primary fluid, condensing the primary fluid and condensing the refrigerant and returning the latter to the cooler, directing the condensed primary fluid into a tube of restricted diameter and there entraining bodies of rarified gas from the refrigerator housing between globules of the fluid, thus compressing the gas, then separating the gas from the primary fluid and introducing it into the refrigerating system, then passing the primary fluid through another tube of restricted diameter and entraining bodies of gas from the refrigerating system in said second tube, thereby compressing the gas and raising its pressure substantially to that of the atmosphere, then separating the compressed gas and the primary fluid and exhausting the gas to the atmosphere and returning the primary fluid to the region of evaporation.

1,949,735. APPARATUS FOR VENTILATING AND CONDITIONING BUILDINGS. Claude A. Bulkeley, Buffalo, N. Y., assignor to Niagara Blower Co., Buffalo, N. Y., a corporation of New York. Application March 31, 1931. Serial No. 526,647. 7 Claims. (Cl. 257—8.)

1. In an apparatus for ventilating and conditioning the air in a room or the like, means for continuously withdrawing air from the room to be conditioned, an air conditioner, means for drawing an amount of fresh air through said air conditioner at all times proportional to said withdrawn room air, means for mixing said conditioned fresh air and said withdrawn room air and discharging said mixed air into said room, means responsive to the air conditions in said room for tempering a part of said withdrawn air, and means for varying the amount of mixed air delivered to the room in accordance with changes in the character of the air in the room.

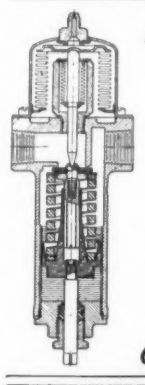
1,949,812. COOLING SYSTEM. Earle S.



1,949,812

Read, New York, N. Y., assignor of one-fourth to Jos. M. Sanders, Jr., as trus-

(*Continued on Page 23, Column 1*)



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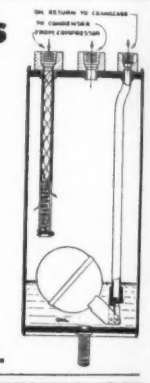

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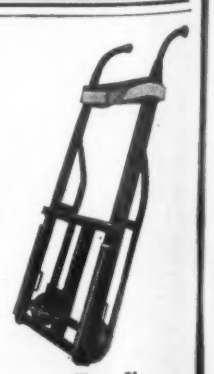
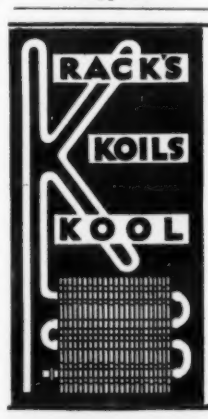


Type Y



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PATENTS

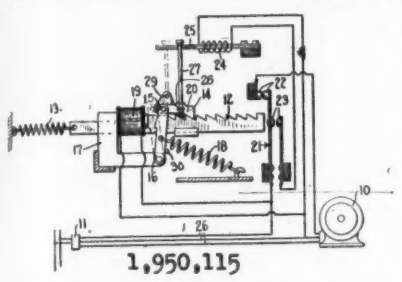
(Continued from Page 22, Column 5)

tee for himself, J. H. Shott, A. G. Fox, A. L. Tyree, and C. W. Freeman, all of Bluefield, W. Va. Application July 19, 1928. Serial No. 293,920. Renewed July 27, 1933. 3 Claims. (Cl. 123—170.)

1. In combination with an internal combustion engine, chambers in heat exchange relation with parts of said engine, a refrigerating system for introducing an expanding refrigerant into said chambers and means responsive to an increase in the load on said engine for increasing the rate of flow of said refrigerant.

1,950,115. DEFROSTER. Walter A. Kuenzli and Clyde E. Ploeger, Evansville, Ind., assignors to Servel, Inc., New York, N. Y., a corporation of Delaware. Application June 29, 1931. Serial No. 547,636. 16 Claims. (Cl. 172—239.)

1. In refrigerating apparatus operated by an electric motor, a defrosting device comprising a normally closed switch in



said motor circuit, means for opening said switch responsive to and at the end of a predetermined number of motor operating periods, and means operative upon instigation of the next succeeding operating period to close said switch after a time interval.

1,950,122. VALVE. Alfred E. Nave and Carl H. Nauert, Evansville, Ind., assignor to Servel, Inc., New York, N. Y., a corporation of Delaware. Application Feb. 25, 1933. Serial No. 658,637. 10 Claims. (Cl. 251—116.)

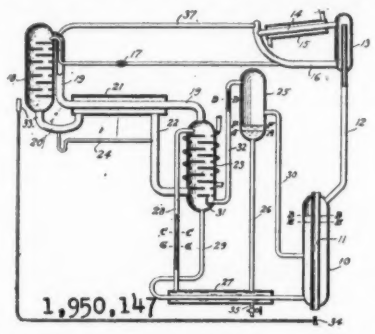
8. A faucet comprising a body having a substantially vertical plate with a projection extending therefrom, said body having a passage terminating in a downward discharge orifice in said projection, said body also having an aperture in said plate below said orfice, a normally closed valve in said passage, a push button in said aperture, and means associated with said push button and valve for opening the valve upon operation of said push button.

1,950,133. WATER RESERVOIR. Howard E. Blood, Detroit, Mich., assignor to Norge Corp., Detroit, Mich., a corporation of Michigan. Original application May 15, 1931. Serial No. 537,554. Divided and this application June 27, 1932. Serial No. 619,454. 1 Claim. (Cl. 62—141.)

As an article of manufacture a fluid container for disposition in a refrigerator comprising a receptacle generally rectangular in shape in plan and having top and bottom walls of dimensions considerably exceeding the dimensions of the side walls, an offset in the bottom wall affording a chamber lower than the remainder of the receptacle when the same is in normal position, and draw off means communicating with the offset chamber.

1,950,147. REFRIGERATION. Donald B. Knight, Brooklyn, N. Y., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application Dec. 20, 1928. Serial No. 327,213. 27 Claims. (Cl. 62—119.5.)

25. A refrigerating system comprising a generator, an absorber, an evaporator, and means dependent on condition of refrigerant in the evaporator for intermittently introducing measured quantities of absorption liquid into the absorber.



1,950,148. CONTROL OF FLUID CIRCULATION. Donald Branch Knight, Brooklyn, N. Y., assignor to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application Jan. 17, 1932. Serial No. 585,369. 13 Claims. (Cl. 62—119.5.)

6. In absorption type refrigerating systems a vapor liquid lift for circulating the absorption liquid, and means for varying the lifting head to control the circulation responsive to the heat input of the system.

1,950,152. REFRIGERATION. Nils Persson, Stockholm, Sweden, assignor, by mesne assignments, to Electrolux Servel Corp., New York, N. Y., a corporation of Delaware. Application Nov. 11, 1930. Serial No. 494,865. In Germany Jan. 25, 1930. 9 Claims. (Cl. 62—119.5.)

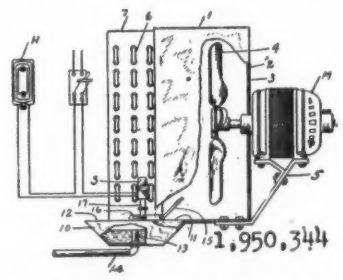
7. In refrigerating apparatus of the continuous absorption type, a generator, an absorber, means spaced from said generator and operated by heat for effecting circulation and absorption liquid between the generator and absorber, and a mass of good heat-conducting material for transferring heat from said means to expel refrigerant gas from solution in the generator.

1,950,180. SOLID CARBON DIOXIDE PRODUCT AND METHOD OF MAKING IT. Charles L. Jones, Pelham, and John D. Small, New York, N. Y., assignors to American Dryice Corp., New York, N. Y., a corporation of New York. Original application March 28, 1929. Serial No. 350,588. Divided and this application Aug. 4, 1933. Serial No. 683,600. 4 Claims. (Cl. 62—121.)

1. A method of making solid carbon dioxide, which includes expanding liquid carbon dioxide in a chamber against a pressure below the triple point and then raising the chamber pressure to or above the triple point, discharging a second portion of liquid into the chamber in contact with the solid made in the earlier step, and then evaporating said liquid at the triple point at a slow rate regulated to produce crystals of large average size.

1,950,344. UNIT COOLER. Walter W. Williams, Bloomington, Ill. Application Feb. 15, 1933. Serial No. 656,816. 4 Claims. (Cl. 62—129.)

1. A unit air cooler and humidifier including a casing, a fan blower therein, an air intake in the casing wall behind the fan, a cooling unit having spaced apart members circulating a refrigerant secured to the casing in front of the casing, an opening provided in the bottom of the casing adjacent the cooling unit, a pivoted



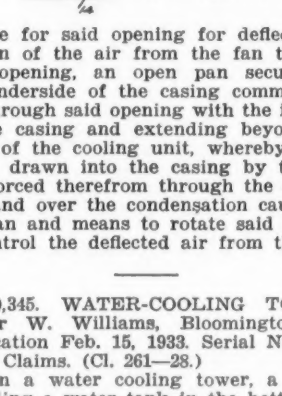
closure for said opening for deflecting a portion of the air from the fan through said opening, an open pan secured to the underside of the casing communicating through said opening with the interior of the casing and extending beyond the front of the cooling unit, whereby warm air is drawn into the casing by the fan and forced therefrom through the cooling unit and over the condensation caught in the pan and means to rotate said closure to control the deflected air from the fan.

1,950,345. WATER-COOLING TOWER. Walter W. Williams, Bloomington, Ill. Application Feb. 15, 1933. Serial No. 656,817. 4 Claims. (Cl. 261—28.)

1. In a water cooling tower, a casing providing a water tank in the bottom, an air discharge at the top and air inlets on the side thereof, a fan blower arranged within the casing to circulate air therein from the inlets through discharge, means conducting the water to be cooled through the air from the fan to precool it, means to spray the precooled water in the circulating air, and means within the water tank to circulate the cooled water collected therein to the water heating medium.

1,950,346. COOLING UNIT. Walter W. Williams and Glenn F. Zellhoefer, Bloomington, Ill.; said Zellhoefer assignor to Williams Oil-O-Matic Heating Corp, Bloomington, Ill., a corporation of Illinois. Application Feb. 15, 1933. Serial No. 656,818. 1 Claim. (Cl. 261—29.)

An air cooler including an outer casing closed at the bottom to form a water tank and having an air discharge at the top with air intakes in the sides thereof, a water collecting chamber having walls spaced apart from the casing in communication with the air discharge and having a central air inlet in the bottom,



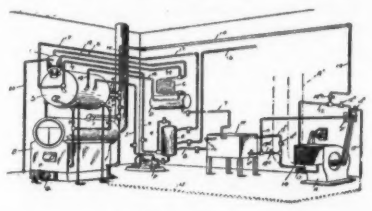
a centrifugal fan comprising a top closure plate and annularly arranged vertical blades depending therefrom, arranged within the casing with its lower end passing through the central bottom opening, a heat exchanger interposed between the water tank and bottom of said chamber including a coil of pipe, a cooling coil of larger diameter arranged about the first coil with the ends of the larger coil connected to a source of refrigeration, a pump located in the water tank below the heat exchanger and having its discharge port connected with the lower end of said coil of smaller pipe, a plurality of vertical pipes arranged within the blades of the fan having spraying nozzles in the sides adjacent the vanes and the lower end of each pipe connected to the upper coil of said smaller pipe, and a plurality of openings arranged concentrically in the bottom of the water collecting chamber adjacent the sides thereof, and means for simultaneously operating the fan and pump whereby the water in the tank is circulated through the smaller coils and the cooled water discharged in a spray through the blades of the fan, the sprayed water collected on the bottom of the chamber returning to the tank in the form of a continuous wall surrounding the cooler coils whereby the air entering the casing intakes is drawn through the descending wall of water from the chamber and is forced through the fan blades together with the sprayed water and thereafter circulated through the spray in the chamber and the cooled and humidified air delivered through the discharge at the top of the casing.

1,950,347. AIR WASHER AND HUMIDIFIER. Walter W. Williams, Bloomington, Ill. Application March 25, 1933. Serial No. 662,712. 2 Claims. (Cl. 261—29.)

1. In a domestic circulating hot air heating system, a casing, a collecting and heating chamber spaced apart from the walls of the casing secured in the upper portion thereof communicating with the hot air ducts of the system, a water tank formed by the bottom walls of the casing, a return air chamber surrounding the casing, said casing provided with a plurality of air inlet apertures in the walls thereof within the air return chamber, said air return chamber communicating with the air return ducts of the system, an electric motor mounted in the upper portion of the collecting and heating chamber, a centrifugal fan mounted upon the driving shaft of the motor within the chamber, a centrifugal pump within the water tank adapted to be operated by the motor to discharge water in the form of a spray through the centrifugal fan, the bottom of said chamber having a plurality of discharge orifices about its periphery and a central opening under the fan whereby operation of the motor sprays water through the fan into the chamber which collects in the bottom and passes therethrough in the form of a wall of water and air drawn by the fan from the air return chamber is washed in passing through the water wall and is humidified in passing through the fan blower in association with the water spray, and means within the chamber for heating the air passed therethrough by the fan.

1,950,349. AIR CONDITIONING APPARATUS. Glenn F. Zellhoefer, Bloomington, Ill., assignor to Williams Oil-O-Matic Heating Corp., Bloomington, Ill., a corporation of Illinois. Application Jan. 5, 1933. Serial No. 650,230. 3 Claims. (Cl. 257—8.)

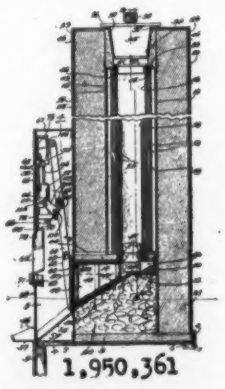
3. In an air circulating system the combination of a continuously operating boiler, a continuously operating fan and a continuously operating pump for conditioning air in said system, with an air



conditioning radiator through which the fan forces air into the system, a refrigerated fluid tank, a steam operated absorption refrigeration plant adapted to be connected to the refrigerating element of the refrigerating plant to refrigerate the fluid in said tank, means adapted to connect the fluid tank to the pump and radiator to circulate this refrigerated fluid through the radiator and means adapted to connect the boiler to the pump to circulate the steam through the radiator and return the condensate to the boiler as may be desired.

1,950,361. VENDING MACHINE. John F. Lindberg, Chicago, Ill., assignor to Orris R. Martin, Chicago, Ill. Application Sept. 8, 1931. Serial No. 561,656. 3 Claims. (Cl. 62—91.5.)

2. In a vending machine for refrigerated articles, a storage chamber and a refrigerant chamber in parallel relation and arranged side by side, the walls of the storage chamber extending away from the refrigerant chamber being of highly heat



conducting material, means for controlling heat transferring contact between said walls and the refrigerant chamber, and the wall of the storage chamber adjacent the refrigerant chamber being thinner than the aforesaid walls so as to be of low heat conducting capacity and being partially insulated from the refrigerant chamber whereby the interchange of heat is distributed more evenly throughout the storage chamber.

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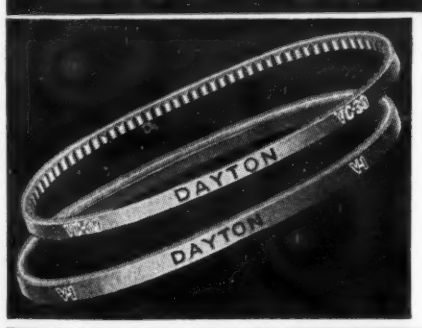

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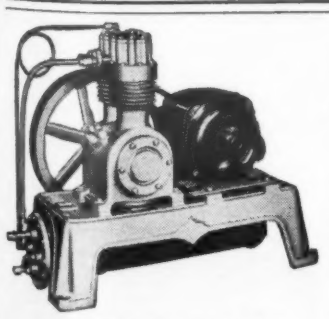

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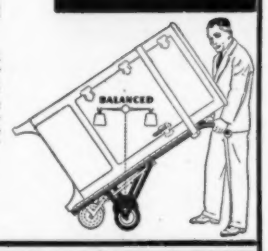

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BROOKLYN—A new lock for refrigerated truck doors, embodying a new principle which serves to seal the door air-tight and also to break the frozen door open without undue strain on lock or door, has been introduced by Kason Hardware Corp.

Principal new feature of the lock is the employment of geared sealing devices which wedge the door tight. These same gears make it possible to "break" the frozen door open. Both operations are based on the principle of leverage on gears.

A center fastener is provided on this lock to prevent the door from sagging.

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BOSTON—One thousand utility representatives, dealers, and salesmen from the New England area attended the spring convention of W. L. Thompson, Inc., General Electric distributor here, held at Boston's Hotel Statler on March 6. Presentation of the '34 refrigeration line was made by A. M. Sweeney, manager of the G-E refrigeration department, Cleveland.